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Report No. 72-0013  
Contract No. NAS8-27359

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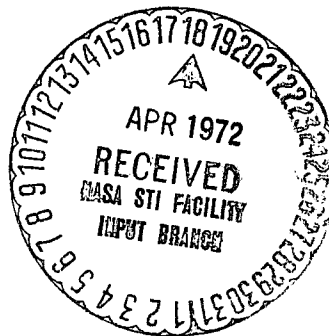
(NASA-CR-123716) CHECKOUT/DEMONSTRATION  
APPLICATION PROGRAM FOR THE SEL 840MP  
MULTI-PROCESSING CONTROL SYSTEM: VERSION 1  
W.F. Anderson, et al (M&S Computing, Inc.)  
27 Mar. 1972 90 p

N72-26155

CSCL 09B G3/08  
Unclas  
15643

CHECKOUT/DEMONSTRATION APPLICATION PROGRAM  
FOR THE  
SEL 840MP MULTI-PROCESSING CONTROL SYSTEM -  
VERSION I (MPCS/1)

March 27, 1972



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Springfield VA 22151

Prepared for:

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
George C. Marshall Space Flight Center  
Marshall Space Flight Center, Alabama 35812

**M&S** COMPUTING, INC.

## PREFACE

This document summarizes the characteristics of the application program developed to verify and demonstrate the SEL 840MP Multi-Processing Control System - Version I (MPCS/1).

The application program emphasizes the display support (using the SEL 810B) and task control (using SEL 840MP) capabilities provided in MPCS/1.

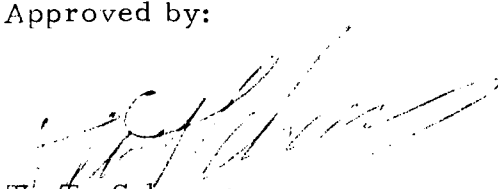
The application program is further intended to be used as an aid to familization with MPCS/1. It complements the information provided in the MPCS/1 Users Guide, Volume I and II.

The application program and MPCS/1 were developed by M&S Computing under contract No. NAS8-27359 for NASA/MSFC.

Prepared by:

W. F. Anderson  
J. R. Conway  
L. C. Keller

Approved by:



T. T. Schansman

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## 1. MPCS CHECKOUT-DEMONSTRATION APPLICATION

### 1.1 Introduction

During the development of the Multi-Processor Control System (MPCS) it became apparent that the sample application programs used for system checkout could, if properly organized, provide the means for demonstrating system capabilities. As a result, a group of application programs (tasks) and a supporting library of CRT displays have been developed to fulfill the dual functions of system checkout and demonstration. These programs and displays, called the MPCS Checkout-Demonstration Application (CDA), are documented herein.

The CDA is user oriented and is designed for user control via the display console. With the help of the tutorial displays, the user can select other displays and initiate application tasks which will exercise particular system facilities. In this manner the user can observe not only the real-time operating capabilities of MPCS, but also typical application examples to assist him in applying MPCS facilities to his particular needs.

A useful by-product of the CDA is its adaptability for use as a teaching aid. It will provide the user with visual examples as well as a vehicle for hands-on operational practice with the display console. As such it is a helpful supplement to the "MPCS User's Guide".

### 1.2 Scope

The CDA is designed to demonstrate the major capabilities added to the baseline operating system (CHANE) to provide effective use of a multiprocessor configuration. In particular it includes explicit demonstrations for the following:

- a) MPCS task control capabilities,
- b) Real-time display support capabilities, and
- c) Display library generation capabilities.

Multitasking can be demonstrated using a single SEL 840 processor and the SEL 810B, or with additional processors when available. Multi-jobbing can be demonstrated by using one processor for the CDA and by using the remaining processors to execute other applications such as assemblies or Fortran compilations.

Other MPCS features are (or at least can be) demonstrated

implicitly by the CDA. For example, Cross-Task Communication is utilized to pass display console input data to an application task. Likewise, Cross-Processor Communication is inherently demonstrated if the CDA is executed in a processor other than the one to which I/O devices are attached. In such a case, I/O between the Display Controller in the 840 and the Display Processor in the 810 is handled by MPCS using Cross-Processor Communication between the 840 in which the CDA is executing and the 840 to which the 810 interface is attached.

The remaining system features such as the CHANE Command Language and I/O support for standard peripheral devices can be easily demonstrated using other applications. An example would be execution of an assembly by one processor with simultaneous execution of the FORTRAN compiler by another processor.

## 2. ORGANIZATION

### 2.1 System Configuration

The Checkout-Demonstration Application (CDA) is a software application which executes in the SEL 840MP under control of the Multi-Processor Control System (MPCS) and supported by the MPCS Display Processor executing in the SEL 810B. It utilizes the following hardware components:

- a) One SEL 840 processor
- b) SEL 840 console typewriter
- c) SEL 810B processor
- d) SEL 810 console typewriter
- e) SEL 816 computer graphics system (attached to the 810)
- f) Disk storage unit (attached to the 810)
- g) SEL 840/810 interface

CDA/MPCS/hardware interfaces are illustrated in Figure 2-1.

### 2.2 Software Configuration

The CDA consists of a series of displays and a group of application tasks (programs).

#### 2.2.1 CDA Displays

Figure 2-2 depicts the "display tree" for the CDA and, to a limited degree, shows the interrelationship of the individual displays within the overall structure.

Table 2-1 lists the displays of the CDA along with the next display and the next task requirements of the compose fields and pen options which exist within each display.

The printed listings of all of the displays as produced by the display librarian are presented in Section 4 and the listings of the librarian input control cards are shown in Appendix A.

# SYSTEM CONFIGURATION

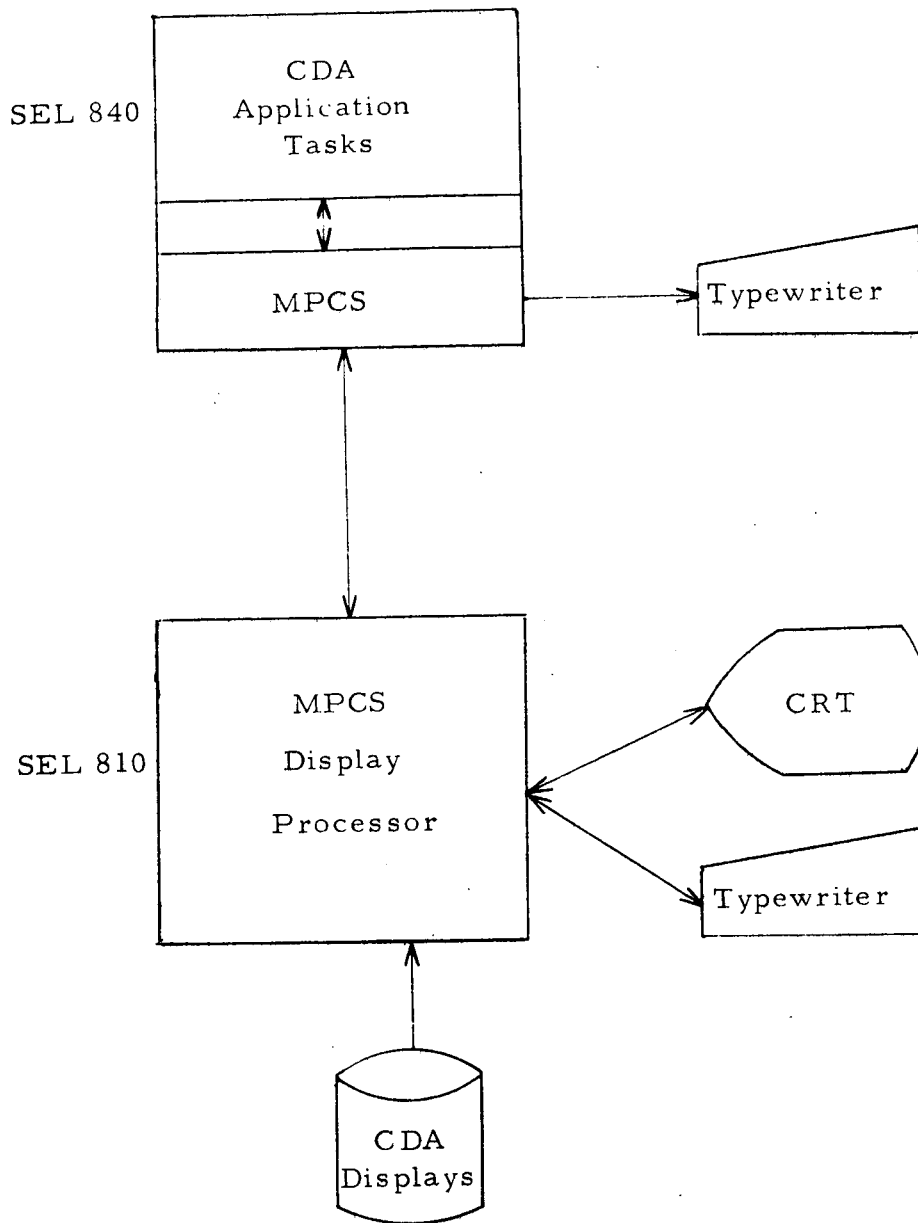


Figure 2-1



# DISPLAY ORGANIZATION

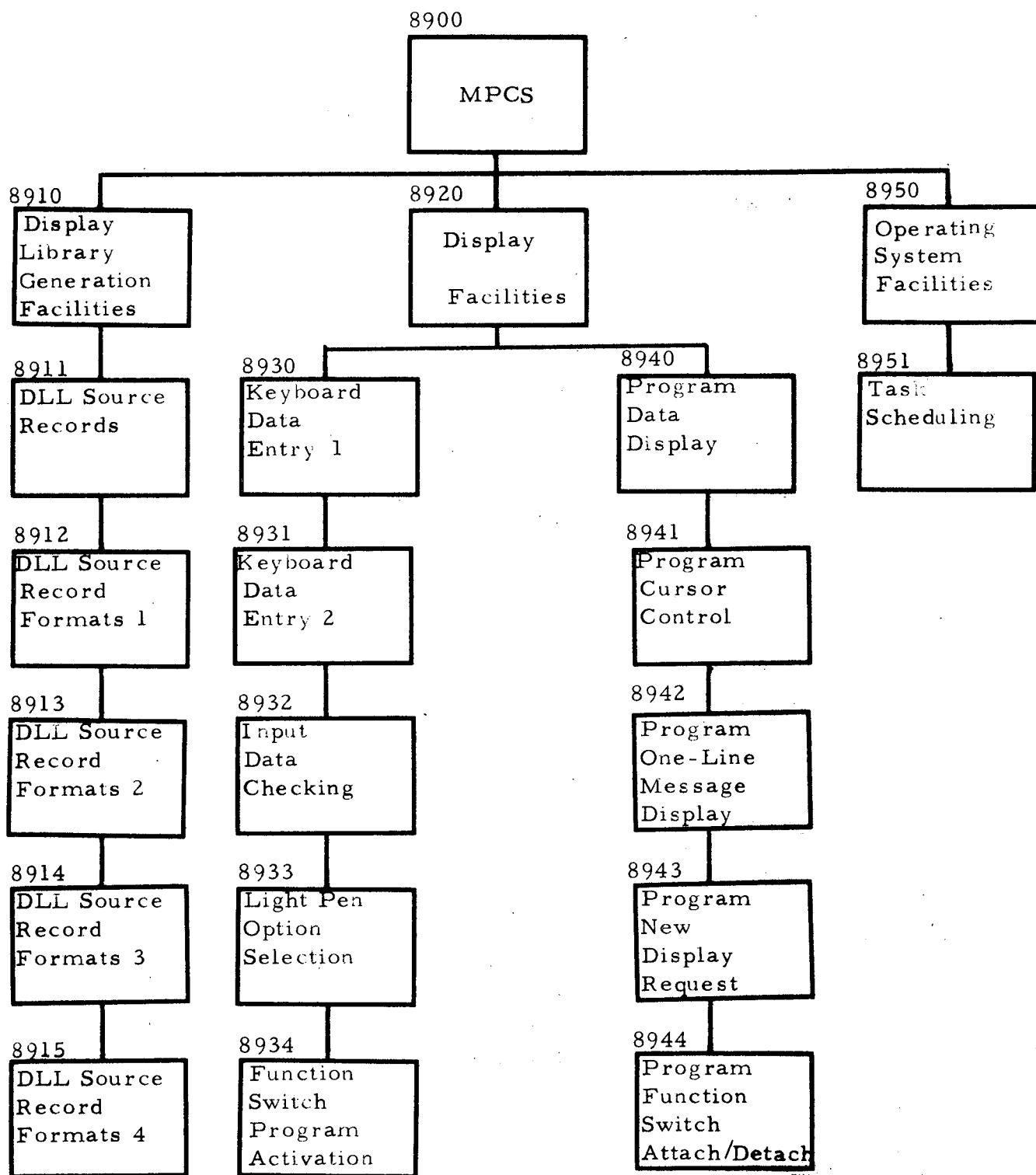


Figure 2-2

# DISPLAY SUMMARY

Display Number	Display Title	Compose Fields		Pen Options	
		Displays	Tasks	Displays	Tasks
8900	Multi-Processor Control System			8910 8920 8950 Same	DTS0
8910	Display Library Generation Facilities			8911	
8911	Display Librarian Language Source Records			8912	
8912	Display Librarian Language Source Record Formats 1			9050 8913	
8913	Display Librarian Language Source Record Formats 2			8914	
8914	Display Librarian Language Source Record Formats 3			8915	DPT1
8915	Display Librarian Language Source Record Formats 4			8900 8920	
8920	Display Facilities			8930 8933 8934 8940 8941 8942 8943 8944	DPT1 DPT 3   DPT4 DPT4
8930	Display Facilities Keyboard Data Entry 1			8931	DPT1

Table 2-1

DISPLAY SUMMARY  
(continued)

Display Number	Display Title	Compose Fields		Pen Options	
		Displays	Tasks	Displays	Tasks
8931	Display Facilities Keyboard Data Entry 2	Same	DPT2	8932	DPT1
8932	Display Facilities Input Data Checking	8932	DPT2	8933	DPT1
8933	Display Facilities Light Pen Option Selection			8934	DPT3
8934	Display Facilities Function Switch Program Activation			Same 8920 8940	DPT3
8940	Display Facilities Program Tabular Data Display	Same	DPT4	Same 8941	DPT4
8941	Display Facilities Program Data Cursor Control	Same	DPT2	Same 8942	DPT4 DPT4
8942	Display Facilities Program One-Line Message Display				
8943	Display Facilities Program New Display Request				
8944	Display Facilities Program Function Switch Attach/Detach			8934 8920 8950	DPT3
8950	Operating System Facilities			8951	
8951	Operating System Task Scheduling Demonstration	Same	DTS2	Same 8900	DTS1 DTS0
9050	Special Displays				

Table 2-1 (continued)

### 2.2.2 CDA Tasks

The tasks which make up the CDA are listed in Table 2-2. This table also shows all sources of activation for each task. Program listings for the tasks are presented in Section 5 with flowcharts in Appendix B.

Control cards used to build the Job Task Table for the CDA are listed in Appendix C.

# TASK SUMMARY

Task Name	Task Description	Scheduled By			Compose Field	Option
		Task	Display			
DPT0	Initialization					
DPT1	Special Character Tabular Data Display	DPT2	8914 8920 8930 8931 8932			1 2 1 1 1
DPT2	Sample Compose Field Processor		8931 8932 8941	1-3 1, 2 1-4		
DPT3	Function Switch Attach/Detach		8920 8933 8934 8944			3 1 1-16 1
DPT4	Application Program Facilities		8920 8940 8941 8942	1		6, 7 1-3 1-5 one-line msg.
DPT8	Function Switch Processor		Any*			
DTS0	Task Scheduling Stop	DPT0	8951 8900			23 4

\* This task will be executed whenever an ATTACHED function switch is raised regardless of which display is active.

Table 2-2

TASK SUMMARY  
(continued)

Task Name	Task Description	Scheduled By			Option
		Task	Display	Compose Field	
DTS1	Task Scheduling Option Processor		8951		1-22
DTS2	Task Scheduling Compose Field Processor		8951	1-7	
DTSA	Sample Task #1 (Periodic)	DTS1			
DTSB	Sample Task #2 (Periodic)	DTS1			
DTSC	Sample Task #3 (Periodic)	DTS1			
DTSD	Sample Task #4	DTS1			
DTSE	Sample Task #5	DTS1			
DTSF	Sample Task #6	DTS1			

Table 2-2 (continued)

### 3. UTILIZATION

#### 3.1 System Initialization

Before the CDA can be exercised, the CDA displays must be generated and loaded into the library disk storage attached to the 810B. If the displays are not in the existing library, they can be created with the CDA Display Source Deck via the library generation and loading procedures discussed in the "MPCS User's Guide".

Assuming the existence of the displays in the library, the MPCS Display Processor is first initialized in the 810B in the manner described in the "MPCS User's Guide". Next the CDA tasks are loaded and activated in the desired 840. Simplified instructions for initializing the CDA are provided in Appendix D.

#### 3.2 User Operation

Once activated, the CDA executes under full control of the user. The initial CDA task automatically loads the first display which contains self-explanatory options. All subsequent functions are activated by the user via the light pen to select options, the display console keyboard to enter compose field data, and the function switches to activate tasks.

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4. CDA DISPLAY LISTINGS

DISPLAY 8900

-----NEXT DISPLAY NAMES-----

8900 MULTI-PROCESSOR CONTROL SYSTEM

MPCS DEMONSTRATION

MPCS HAS BEEN DESIGNED TO PROVIDE FACILITIES FOR CONCURRENT EXECUTION OF JOB COMPONENTS(TASKS) BY MULTIPLE PROCESSORS. THESE FACILITIES INCLUDE SYSTEM SERVICES FOR TASK CONTROL, CROSS-PROCESSOR COMMUNICATION, AND CRT DISPLAY SUPPORT IN ADDITION TO THE CAPABILITIES PROVIDED BY THE CHANE OPERATING SYSTEM.

THIS DEMONSTRATION HAS BEEN ORGANIZED INTO SEVERAL SECTIONS EACH OF WHICH CAN BE USED INDEPENDENTLY BY SELECTING THE APPROPRIATE LIGHT PEN OPTION BELOW.

<\*> DISPLAY LIBRARY GENERATION FACILITIES

<\*> REAL-TIME DISPLAY FACILITIES

<\*> OPERATING SYSTEM FACILITIES

\*8910

\*8920

\*8950

NOTE - IN ORDER TO SELECT AN OPTION, TOUCH THE LIGHT PEN BEAM TO ONE OF THE ASTERISK SYMBOLS AND DEPRESS THE BUTTON ON THE SIDE OF THE LIGHT PEN.

<\*> TERMINATE DEMONSTRATION

\*SAME

RETURN TO PRIOR LEVEL  
(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)

<\*>

<\*>

\*PREV

\*SAME

# DISPLAY 8910

-----NEXT DISPLAY NAMES-----

## 8910 DISPLAY LIBRARY GENERATION FACILITIES

THERE ARE FOUR BASIC STEPS IN GENERATING THE DISPLAY LIBRARY FOR APPLICATION PROGRAMS.

1. DEFINE THE DISPLAYS NECESSARY FOR THE APPLICATION OR APPLICATIONS.
2. USING THE DISPLAY LIBRARIAN LANGUAGE(DLL), CODE THE DISPLAY FORMATTING INFORMATION AND PUNCH THIS INFORMATION IN SOURCE CARDS.
3. INPUT THE SOURCE CARDS TO THE DISPLAY LIBRARIAN PROGRAM WHICH IN TURN WILL CREATE A MAGNETIC TAPE CONTAINING THE DISPLAY LIBRARY.
4. TRANSFER THE DISPLAY LIBRARY FROM MAGNETIC TAPE (HARD STORAGE) TO THE 810B DISK FOR ON-LINE EXECUTION.

THE DISPLAY LIBRARY IS CREATED BY THE DISPLAY LIBRARIAN PROGRAM USING THE DLL CODED INPUT. DLL IS AN EASY TO USE CODING LANGUAGE CONSISTING OF ELEVEN OPERATORS.

THEY ARE-

- |                  |     |                 |     |            |     |
|------------------|-----|-----------------|-----|------------|-----|
| 1. OUTPUT OPTION | -O- | 5. COMPOSE      | -C- | 9. TEXT    | -T- |
| 2. INPUT OPTION  | -I- | 6. LEGALITY     | -X- | 10. END    | -E- |
| 3. NAME          | -N- | 7. LINE         | -L- | 11. DELETE | -D- |
| 4. PEN           | -P- | 8. TEXT CONTROL | -@- |            |     |

DISPLAY 8911 GIVES A FUNCTIONAL EXPLANATION OF THESE SOURCE RECORDS.

<SELECT 8911>

RETURN TO PRIOR LEVEL

(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)

<><>

\*PREV  
\*SAME

8911 DISPLAY LIBRARIAN LANGUAGE SOURCE RECORDS

DLL SOURCE RECORDS ARE OF THREE TYPES.

1. RECORDS REQUIRED TO INPUT PROGRAM OPTION SELECTIONS AND CONTROL PARAMETERS TO THE LIBRARIAN PROGRAM. RECORDS OF THIS TYPE ARE THE- OUTPUT OPTION, INPUT OPTION, NAME, TEXT CONTROL, END, AND DELETE RECORDS.
2. CONTROL PAGE RECORDS WHICH CONTAIN CONTROL INFORMATION REQUIRED FOR EXECUTION OF THE DISPLAY OPTIONS BY THE ON-LINE DISPLAY PROGRAM. THE DISPLAY OPTIONS FOR WHICH CONTROL INFORMATION IS INPUT BY THESE RECORDS ARE- KEYBOARD DATA ENTRY, LIGHT PEN OPTION, AND LINE VECTOR DISPLAY. RECORDS OF THIS TYPE ARE THE- PEN, COMPOSE, LEGALITY, AND LINE RECORDS.
3. TEXT RECORDS WHICH DEFINE THE DATA THAT IS TO APPEAR ON THE DISPLAY. TEXT RECORDS ALSO DEFINE THE AREAS ON THE DISPLAY WHERE THE DISPLAY OPTIONS ARE TO APPEAR, AND THEY CONTAIN DATA TO DEFINE APPLICATION PROGRAM FILL-IN AREAS ON THE DISPLAY.

DISPLAYS 8912-8915 GIVE FORMAT ILLUSTRATIONS OF THE DLL SOURCE RECORDS.

<SELECT 8912>

8912

RETURN TO PRIOR LEVEL  
(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)

<\*> PREV  
<\*> SAME

# DISPLAY 8912

-----NEXT DISPLAY NAMES-----

## 8912 DISPLAY LIBRARIAN LANGUAGE - SOURCE RECORD FORMATS -1-

THE CODED DLL SOURCE RECORDS ARE INPUT TO THE DISPLAY LIBRARIAN PROGRAM ON 80 COLUMN PUNCHED CARDS AND EACH RECORD REQUIRES AN IDENTIFIER CHARACTER IN CARD COLUMN 1.

### OUTPUT OPTION CARD -0-

- 0,S,P,L - OPTIONAL CONTROL CARD, IF NOT INCLUDED IN INPUT DECK THE DISPLAY LIBRARIAN WILL ASSUME THE 'P' OPTION WAS SELECTED.
- S=LIST SOURCE CARDS
- P=OUTPUT PRINTED DISPLAYS TO LINE PRINTER
- L=WRITE-ADD DISPLAYS TO DISPLAY LIBRARY

### INPUT OPTION CARD -1-

- I,1 - INPUT NORMALLY IS FROM CARDS. FOR CARD IMAGE MAGNETIC TAPE INPUT, THIS OPTION CARD IS USED.

### NAME CARD -N-

- N,XXXX - XXXX IS THE DISPLAY NAME TAG. IT CAN BE ANY FOUR DIGIT NUMBER FROM 0001 THROUGH 9999. DISPLAY NAME TAGS FROM 0001 THROUGH 8999 WILL BE USED FOR NORMAL DISPLAYS AND DISPLAY NAME TAGS FROM 9000 THROUGH 9999 WILL BE USED FOR SPECIAL DISPLAYS. SELECT THE FOR A DESCRIPTION OF SPECIAL DISPLAYS, SELECT THE 9050 PER OPTION WHICH FOLLOWS <SELECT 9050>.

FOR FORMAT ILLUSTRATIONS OF THE REMAINING DLL SOURCE RECORDS SELECT 8913.

<SELECT 8913>

RETURN TO PRIOR LEVEL

(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)

<\*>  
<\*>

\*PREV  
\*SAME

\*9050

\*8913

# DISPLAY 8913

-----NEXT DISPLAY NAMES-----

8913 DISPLAY LIBRARIAN LANGUAGE - SOURCE RECORD FORMATS -2-

PEN CARD -P-  
P,XXXX,YYYY - XXXX=NAME TAG OF THE DISPLAY TO BE LOADED WHEN THE OPTION  
IS SELECTED, 0001-9999  
'SAME' WILL CAUSE THE CURRENT DISPLAY TO BE RETAINED.  
'PREV' WILL CAUSE THE PREVIOUS DISPLAY TO BE RELOADED  
YYYY=NAME OF THE TASK TO BE SCHEDULED WHEN THE OPTION  
IS SELECTED, THIS PARAMETER IS OPTIONAL.

COMPOSE CARD -C-  
C,UU,VV,XXXX,YYYY - UU=NUMBER OF SUBFIELDS IN THIS COMPOSE FIELD,  
CAN BE A ONE OR TWO DIGIT NUMBER  
VV=NUMBER OF CHARACTERS IN THIS COMPOSE FIELD,  
CAN BE A ONE OR TWO DIGIT NUMBER  
XXXX=NEXT DISPLAY NAME TAG \*SAME AS PEN CARD\*  
YYYY=NEXT TASK NAME \*SAME AS PEN CARD EXCEPT IT  
IS REQUIRED FOR THE COMPOSE CARD\*

LEGALITY CARD -X-  
X(L1I1R1)(L2I2R2),...,(LNTNKN) - L=NUMBER OF RESTRICTION CHARACTERS  
- T=TYPE OF RESTRICTION DATA  
0=OCTAL B=BINARY D=DECIMAL  
A=ALPHABETIC X=NO CHECKING  
S=SPECIAL-DEFINITION OF SPECIAL  
CHARACTERS WILL BE SHOWN IN  
ON-LINE DISPLAY FACILITIES, DISPLAY  
8931  
- R=RESTRICTION DATA -EXPLICIT MAGNITUDE,  
MAGNITUDE RANGE, OR BOTH ALLOWED

FORMAT ILLUSTRATIONS CONTINUE ON DISPLAY 8914.

<SELECT 8914>

RETURN TO PRIOR LEVEL <\*>  
(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES) <\*>  
\*PREV  
\*SAME

# DISPLAY 8914

-----NEXT DISPLAY NAMES-----

## 8914 DISPLAY LIBRARIAN LANGUAGE - SOURCE RECORD FORMATS -3-

LINE CARD -L-  
LINE VECTORS AND TEXT UNDERLINES CAN BE INCLUDED IN THE DISPLAY.  
THERE ARE TWO FORMATS.

1. L,C,IIII,JJJJ,KKK,LLLL - C=LINE VECTOR SPECIFIED  
IIII=FROM X ORDINATE JJJJ=FROM Y ORDINATE  
KKK=TO X ORDINATE LLLL=TO Y ORDINATE

2. L,L,MM,NN,00,PP - L=TEXT UNDERLINE SPECIFIED  
MM=FROM CHARACTER NUMBER NN=FROM LINE NUMBER  
00=TO CHARACTER NUMBER PP=TO LINE NUMBER

SHOWN BELOW ARE EXAMPLES OF LINE VECTOR AND TEXT UNDERLINE USAGE-

THE LINES SHOWN AT THE RIGHT WERE SPECIFIED \*SELECT HI\*\*SELECT LOW\*  
IN TEXT UNDERLINE FORMAT BY- \*SELECT SI\*\*SELECT END\*

L,L,4,18,70,18 AND L,L,58,17,58,19

HOWEVER, THEY COULD HAVE BEEN SPECIFIED IN \*SELECT HI\*\*SELECT LOW\*  
LINE VECTOR FORMAT BY-

L,C,610,407,874,407 AND L,C,742,431,742,383

THE LINES NOW SHOWN IN THE EXAMPLE AT RIGHT,  
WERE SPECIFIED BY-

L,C,632,313,828,193  
L,C,632,193,828,313

FORMAT ILLUSTRATIONS ARE CONCLUDED ON DISPLAY 8915. <SELECT 8915>  
RETURN TO PRIOR LEVEL <\*>  
(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES) <\*>

\*8915  
\*PREV  
\*SAME

# DISPLAY 8915

-----NEXT DISPLAY NAMES-----

8915 DISPLAY LIBRARIAN LANGUAGE - SOURCE RECORD FORMATS -4-

## TEXT CONTROL CARD -\*\*

- THIS CONTROL CARD IS USED TO ADVISE THE DISPLAY LIBRARIAN PROGRAM THAT ALL CONTROL PAGE SOURCE RECORDS FOR THE DISPLAY HAVE BEEN INPUT.
- IT MUST IMMEDIATELY FOLLOW THE LAST CONTROL PAGE SOURCE CARD IN THE INPUT DECK.

## TEXT CARD -T-

- T,JJJJ.....JJJ - THE J'S REPRESENT TEXT DATA. EACH RECORD WILL DEFINE ONE LINE OF TEXT ON THE DISPLAY AND MAY CONTAIN UP TO SEVENTY-FIVE TEXT CHARACTERS. A MAXIMUM OF THIRTY-FIVE TEXT RECORDS ARE ALLOWED FOR A NORMAL DISPLAY. ALL TEXT RECORDS MUST FOLLOW THE TEXT CONTROL CARD IN THE INPUT STREAM, AND MUST BE IN THE ORDER THE TEXT IS TO APPEAR ON THE DISPLAY.
- CHARACTERS THAT WILL HAVE SPECIAL MEANING IN THE TEXT DATA ARE- # AND # INDICATING A PEN OPTION, THE # INDICATING A COMPOSE FIELD OR SUBFIELD, AND THE # INDICATING AN APPLICATION PROGRAM FILL-IN FIELD.

## END CARD -E-

- INDICATES END OF INPUT DATA FOR A DISPLAY.

## DELETE CARD -D-

- D,xxxx - xxxx=DISPLAY NAME TAG. DELETES DISPLAY xxxx FROM THE DISPLAY LIBRARY TAPE.

## <END OF SECTION>

RETURN TO PRIOR LEVEL  
(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)

<CONTINUE>

<\*>

<\*>

\*8900,8920

\*PREV

\*SAME



# DISPLAY 8920

-----NEXT DISPLAY NAMES-----

8920

## DISPLAY FACILITIES

### DISPLAY CONSOLE OPERATOR CONTROL CAPABILITIES

- <\*> KEYBOARD DATA ENTRY \*8930
- <\*> LIGHT PEN OPTION SELECTION \*8933
- <\*> FUNCTION SWITCH PROGRAM ACTIVATION \*8934

### APPLICATION PROGRAM DISPLAY CAPABILITIES

- <\*> TABULAR DATA (FILL-IN) DISPLAY \*8940
- <\*> DATA CURSOR CONTROL \*8941
- <\*> ONE-LINE MESSAGE DISPLAY \*8942
- <\*> NEW DISPLAY REQUEST \*8943
- <\*> FUNCTION SWITCH ATTACH-DETACH \*8944

TO OBTAIN DETAILED ILLUSTRATIONS OF ANY OF THESE FACILITIES, USE THE LIGHT PEN TO SELECT THE APPROPRIATE OPTION.

RETURN TO PRIOR LEVEL

(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)

<\*>  
<\*>

\*PREV  
\*SAME

8930            DISPLAY FACILITIES - KEYBOARD DATA ENTRY

THE CONSOLE KEYBOARD CAN BE USED TO ENTER DATA INTO PRE-DEFINED COMPOSE  
FIELDS IN A DISPLAY AND TO CAUSE THE ENTERED DATA TO BE PASSED TO AN  
APPLICATION PROGRAM FOR PROCESSING.

THE COMPOSE FIELDS APPEAR ON THE SCREEN AS SLASH CHARACTERS. THEY ARE  
REPLACED WITH INPUT DATA AS IT IS RECEIVED. A DATA CURSOR APPEARS ON  
THE SCREEN TO INDICATE WHERE THE NEXT INPUT CHARACTER WILL BE PLACED.  
IT CAN BE POSITIONED AT ANY COMPOSE FIELD CHARACTER DESIRED BY THE  
OPERATOR.

AFTER ALL DESIRED DATA HAS BEEN ENTERED FOR A GIVEN COMPOSE FIELD, THE  
OPERATOR CAN USE THE "RETURN" KEY TO PASS THE DATA TO AN APPLICATION  
PROGRAM. WHEN THE "RETURN" KEY IS DEPRESSED, THE TASK ASSOCIATED WITH  
THE COMPOSE FIELD IS SCHEDULED FOR EXECUTION IN THE 840 AND ONE OF THE  
FOLLOWING WILL APPEAR ON THE SCREEN DEPENDING ON HOW THE COMPOSE FIELD  
WAS DEFINED.

1. A NEW DISPLAY
2. THE SAME DISPLAY (REFRESHED TO ORIGINAL FORM)
3. THE SAME DISPLAY (UNREFRESHED)

<CONTINUE>

8931

RETURN TO PRIOR LEVEL  
(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)

<\*>      <\*>

\*PREV  
\*SAME

# DISPLAY 8931

-----NEXT DISPLAY NAMES-----

## 8931            DISPLAY FACILITIES - KEYBOARD DATA ENTRY

DATA CURSOR CONTROL IS PROVIDED THROUGH THE USE OF SEVERAL SPECIAL KEYS.

KEY	FUNCTION
SEMI-COLON	CURSOR RIGHT
DELETE	CURSOR LEFT
COLON	CURSOR UP
LINE FEED	CURSOR DOWN
"AT" SIGN	CURSOR HOME (FIRST COMPOSE FIELD)

THE VALID DATA ENTRY KEYS INCLUDE

ALPHABETIC A-Z  
 NUMERIC 0-9  
 SPECIAL ' ' " ( ) # = + - \* # BLANK

ALL OTHER CHARACTERS WILL BE IGNORED.

USE THE FOLLOWING SAMPLE COMPOSE FIELDS TO GET THE FEEL OF DATA ENTRY AND CURSOR MANIPULATION.

COMPOSE FIELD A	DATE = /// // /// (MONTH DAY YEAR)
COMPOSE FIELD B	VELOCITY = /// (FEET PER SECOND)
COMPOSE FIELD C	//

\*SAME  
 \*SAME  
 \*SAME

THE DATA YOU HAVE ENTERED WILL BE RE-DISPLAYED IN THE ONE-LINE MESSAGE AT THE BOTTOM OF THE SCREEN.

IT SHOULD BE NOTED THAT ONLY ONE COMPOSE FIELD CAN BE PROCESSED AT A TIME. WHENEVER THE CURSOR IS MOVED TO A NEW COMPOSE FIELD, THE INPUT BUFFER IS RE-INITIALIZED WITH BLANKS.

<CONTINUE>

\*8932

RETURN TO PRIOR LEVEL

(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)

<\*>  
 <\*>

\*PREV  
 \*SAME

8932

DISPLAY FACILITIES - INPUT DATA CHECKING

DATA ENTERED VIA THE CONSOLE KEYBOARD CAN BE EXAMINED FOR VALIDITY AUTOMATICALLY THROUGH THE USE OF PRE-DEFINED LEGALITY DATA. THIS DATA CAN SPECIFY VALIDITY CHECKS TO BE MADE ON BOTH TYPE AND MAGNITUDE OF THE INPUT DATA. FOR PURPOSES OF VALIDITY CHECKING, A COMPOSE FIELD CAN BE BROKEN DOWN INTO SUBFIELDS WITH A DATA TYPE AND ONE OR MORE SETS OF LIMITS SPECIFIED FOR EACH SUBFIELD. THESE LEGALITY CHECKS, IF SPECIFIED, ARE PERFORMED WHEN THE OPERATOR DEPRESSES THE "RETURN" KEY. IF AN ERROR IS DETECTED, A MESSAGE IS DISPLAYED AT THE BOTTOM OF THE SCREEN AND THE CURSOR IS POSITIONED TO THE INVALID CHARACTER OR TO THE SUBFIELD WHICH IS OUT OF LIMITS.

THE LEGALITY SPECIFICATIONS FOR THE FOLLOWING COMPOSE FIELDS ARE SHOWN BELOW. CARE TO TRY?

COMPOSE FIELD A - /// // /// (MONTH DAY YEAR)

111 22 333

SUBFIELD 1 - ALPHABETIC WITH VALUES LIMITED TO

JAN,FEB,MAR,APR,MAY,JUN,JUL,AUG,SEP,OCT,NOV,DEC  
01-31

SUBFIELD 2 - DECIMAL WITH VALUES LIMITED TO

SUBFIELD 3 - DECIMAL WITH VALUES LIMITED TO 2001

COMPOSE FIELD B - / / ///

4 5 677

SUBFIELD 4 - ALPHABETIC WITH VALUES LIMITED TO X,Y,Z

SUBFIELD 5 - SPECIAL WITH VALUES LIMITED TO #,.,#

SUBFIELD 6 - SPECIAL WITH VALUES LIMITED TO +,-,BLANK

SUBFIELD 7 - OCTAL WITH NO LIMITS

NOTE THAT LEGALITY CHECKING SUBFIELDS DO NOT NECESSARILY HAVE TO HAVE A ONE-TO-ONE CORRESPONDENCE TO THE SUBFIELD DIVISIONS ON THE SCREEN.

RETURN TO PRIOR LEVEL

(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)

<CONTINUE>

<0>

<0>

8933

PREV

SAME

1. A NEW DISPLAY
2. THE SAME DISPLAY (REFRESHED TO ORIGINAL FORM)
3. THE SAME DISPLAY (UNREFRESHED)

TWO STANDARD OPTIONS EXIST AT THE BOTTOM OF THE SCREEN FOR EVERY DISPLAY. THE FIRST PROVIDES THE CAPABILITY TO RETURN THE PRECEDING DISPLAY TO THE SCREEN. NO TASK GETS SCHEDULED BY SELECTION OF THIS OPTION. THE SECOND STANDARD OPTION IS ASSOCIATED WITH THE ONE-LINE MESSAGE. USUALLY, SELECTION OF THIS OPTION WILL NOT CAUSE EITHER A NEW DISPLAY TO BE LOADED OR A TASK TO BE SCHEDULED. HOWEVER, THE CAPABILITY EXISTS TO ALLOW APPLICATION PROGRAMS TO SPECIFY A DISPLAY AND/OR A TASK TO BE ASSOCIATED WITH THE OPTION.

```

<CONTINUE>
      *8934
      *
      *PREV
      *SAME

```

# DISPLAY 8934

-----X----- DISPLAY NAMES-----

## 8934 DISPLAY FACILITIES - FUNCTION SWITCH PROGRAM ACTIVATION

THE FUNCTION SWITCHES LOCATED ON EACH SIDE OF THE SCREEN CAN BE USED TO ACTIVATE APPLICATION PROGRAMS. HOWEVER, BEFORE THEY CAN BE UTILIZED, AN APPLICATION PROGRAM MUST HAVE ATTACHED TASKS TO THE ASSOCIATED SWITCHES. (REFER TO THE APPLICATION PROGRAM DISPLAY CAPABILITIES.) THE TASK CURRENTLY ATTACHED TO A GIVEN SWITCH WILL BE SCHEDULED FOR EXECUTION EACH TIME THE SWITCH IS RAISED.

FOR PURPOSES OF DEMONSTRATION, USE THE LIGHT PEN TO SELECT ONE OR MORE SWITCHES TO BE ATTACHED. THEN RAISE THE SWITCH(ES) TO ACTIVATE THE ASSOCIATED TASK(S).

<1>	#	#	<9>	*SAME, SAME
<2>	#	#	<10>	*SAME, SAME
<3>	#	#	<11>	*SAME, SAME
<4>	#	#	<12>	*SAME, SAME
<5>	#	#	<13>	*SAME, SAME
<6>	#	#	<14>	*SAME, SAME
<7>	#	#	<15>	*SAME, SAME
<8>	#	#	<16>	*SAME, SAME

<END OF SECTION>

<CONTINUE>

RETURN TO PRIOR LEVEL  
(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)

\*PREV  
\*SAME

\*8920,8940

# DISPLAY 8940

-----NEXT DISPLAY NAMES-----

## 8940      DISPLAY FACILITIES - PROGRAM TABULAR DATA DISPLAY

APPLICATION PROGRAMS EXECUTING IN THE 840 CAN DISPLAY DATA IN PRE-DEFINED FIELDS WHICH APPEAR ON THE SCREEN AS POUND SIGNS WHEN A GIVEN DISPLAY IS INITIALLY LOADED. THE POUND SIGNS ARE REPLACED WITH THE TABULAR DATA AS IT IS RECEIVED FROM APPLICATION PROGRAMS. CAPABILITIES ARE PROVIDED TO ENABLE APPLICATION PROGRAMS TO ADD TO PREVIOUSLY DISPLAYED DATA, DELETE PREVIOUSLY DISPLAYED DATA, OR UPDATE PREVIOUSLY DISPLAYED DATA. USE THE LIGHT PEN OR KEYBOARD TO ACTIVATE DEMONSTRATIONS OF THESE CAPABILITIES.

1. ADD 3 CHARACTERS EACH TIME SELECTED      <+>      \*SAME
2. DELETE ALL PREVIOUSLY DISPLAYED TABULAR DATA      <+>      \*SAME
3. UPDATE CHARACTERS 5-7 EACH TIME SELECTED      <+>      \*SAME
4. UPDATE STARTING AT CHARACTER // WITH ////      \*SAME

AA      98888  
SUBFIELD A - DECIMAL VALUE FROM 01-48  
SUBFIELD B - ANY DISPLAYABLE CHARACTERS

```
#####
## ##
#####
## ##
#####
```

RETURN TO PRIOR LEVEL      <+>      \*PREV  
(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)      <+>      \*SAME

<CONTINUE>

\*8941

# DISPLAY 8941

-----NEXT DISPLAY NAMES-----

## 8941      DISPLAY FACILITIES - PROGRAM DATA CURSOR CONTROL

APPLICATION PROGRAMS EXECUTING IN THE 840 CAN MOVE THE DATA CURSOR TO THE BEGINNING OF ANY COMPOSE FIELD IN THE CURRENT DISPLAY. THIS CAPABILITY SHOULD BE USED WITH DISCRETION SINCE IT RE-INITIALIZES THE KEYBOARD INPUT BUFFER WITH BLANKS. IF THE CONSOLE OPERATOR HAS JUST KEYED IN A LENGTHY COMPOSE FIELD, HE WON'T APPRECIATE HAVING HIS DATA DESTROYED.

FOR DEMONSTRATION PURPOSES, USE THE LIGHT PEN TO SELECT A COMPOSE FIELD IN WHICH THE CURSOR SHALL BE MOVED. YOU STILL HAVE THE CAPABILITY TO CONTROL THE CURSOR FROM THE KEYBOARD.

- |   |          |     |
|---|----------|-----|
| 1 | //////// | <1> |
| 2 | // //    | <2> |
| 3 | // //    | <3> |
| 4 | //////// | <4> |

\*SAME, SAME  
\*SAME, SAME  
\*SAME, SAME  
\*SAME, SAME

<CONTINUE>

8942

RETURN TO PRIOR LEVEL  
(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)

<\*>  
<\*>  
\*REV  
\*SAME



# DISPLAY 8942

-----NEXT DISPLAY NAMES-----

## 8942 DISPLAY FACILITIES - PROGRAM ONE-LINE MESSAGE DISPLAY

APPLICATION PROGRAMS EXECUTING IN THE 840 CAN DISPLAY MESSAGES IN THE SPECIAL ONE-LINE MESSAGE AREA AT THE BOTTOM OF THE SCREEN. IN ADDITION, THE CAPABILITY EXISTS TO SPECIFY A DISPLAY TAG AND A TASK NAME TO BE ATTACHED TO THE LIGHT PEN OPTION ASSOCIATED WITH THE ONE-LINE MESSAGE.

IT SHOULD BE NOTED THAT THE MESSAGE AREA IS UNPROTECTED IN THE SENSE THAT A MESSAGE MAY BE REPLACED WITH A MESSAGE FROM THE SYSTEM OR FROM ANOTHER APPLICATION PROGRAM BEFORE IT CAN BE READ BY THE OPERATOR.

WHEN YOU SELECTED THIS DISPLAY A TASK WAS SCHEDULED WHICH ISSUED THE MESSAGE SHOWN BELOW.

RETURN TO PRIOR LEVEL  
(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)

<\*>      \*PREV  
<\*>      \*SAME

# DISPLAY 8943

-----NEXT DISPLAY NAMES-----

## 8943      DISPLAY FACILITIES - PROGRAM NEW DISPLAY REQUEST

APPLICATION PROGRAMS EXECUTING IN THE 840 CAN REQUEST A NEW DISPLAY TO APPEAR ON THE SCREEN WITH OR WITHOUT THE SCHEDULING OF A NEW TASK. SUCH A REQUEST CAN BE MADE IN ONE OF TWO MODES.

1. AUTOMATIC MODE - THE NEW DISPLAY IS LOADED IMMEDIATELY AND THE TASK, IF SPECIFIED, IS SCHEDULED FOR EXECUTION.
2. DELAYED MODE - THE SYSTEM DISPLAYS THE MESSAGE SHOWN BELOW AND UPON SELECTION OF THE OPTION BY THE OPERATOR, THE NEW DISPLAY IS LOADED AND THE TASK, IF SPECIFIED, IS SCHEDULED FOR EXECUTION.

WHEN YOU SELECTED THIS DISPLAY A TASK WAS SCHEDULED WHICH ISSUED A DELAYED MODE REQUEST FOR THE NEXT DISPLAY IN THE DEMONSTRATION. PROCEED AT WILL.

RETURN TO PRIOR LEVEL      <\*>      \*PREV  
(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)      <\*>      \*SAME

# DISPLAY 8944

-----NEXT DISPLAY NAMES-----

## 8944 DISPLAY FACILITIES - PROGRAM FUNCTION SWITCH ATTACH-DETACH

APPLICATION PROGRAMS EXECUTING IN THE 840 MUST ATTACH TASKS TO THE  
DISPLAY CONSOLE FUNCTION SWITCHES (ONE TASK PER SWITCH FOR ANY NUMBER  
OF SWITCHES) BEFORE THE SWITCHES CAN BE UTILIZED. ONCE A TASK IS  
ATTACHED TO A SWITCH, IT IS SCHEDULED FOR EXECUTION EACH TIME THE  
SWITCH IS RAISED BY THE OPERATOR.

APPLICATION PROGRAMS CAN ALSO DETACH TASKS FROM FUNCTION SWITCHES WHEN  
IT IS NECESSARY TO STOP THE FUNCTION SWITCH SCHEDULING PROCESS.

THE EFFECTS OF THE ATTACH-DETACH FACILITY ARE ILLUSTRATED IN THE SECTION  
OF THE DEMONSTRATION PERTAINING TO CONSOLE OPERATOR CAPABILITIES.

<FUNCTION SWITCH DEMO>

<END OF SECTION>

<CONTINUE>

RETURN TO PRIOR LEVEL

(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)

<\*>

<\*>

\*PREV

\*SAME

\*8934

\*8920,8950

DISPLAY 8950

-----NEXT DISPLAY NAMES-----

8950

OPERATING SYSTEM FACILITIES

OPERATING SYSTEM SERVICES ARE AVAILABLE TO USERS THROUGH THE FOLLOWING  
EXECUTIVE CALLS.

TASK SCHEDULING

PERIODIC

SINGLE-ENTRY

MULTIPLE-ENTRY

PRIORITY(NON-PERIODIC)

SINGLE-ENTRY

MULTIPLE-ENTRY

NEXT TASK

TASK SUSPENSION

SPECIFIED PERIOD

INDEFINITELY

TASK TERMINATION

TASK DELETION

CHECK TASK STATUS

CROSS-TASK COMMUNICATION

INITIALIZE PARAMETERS-BUFFERS

TRANSMIT-RECEIVE

CROSS-PROCESSOR COMMUNICATION

THIS LIST OF SERVICES INCLUDES ONLY THOSE UNIQUELY SUPPLIED BY MPUS.  
ALSO AVAILABLE ARE THE SERVICES PROVIDED BY CHAME INCLUDING THOSE FOR  
PROCESSING I-0.

RETURN TO PRIOR LEVEL

(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)

<CONTINUE>

<\*>

<\*>

\*8951

\*PREV

\*SAME

# DISPLAY 8951

-----NEXT DISPLAY NAMES-----

## 8951 OPERATING SYSTEM - TASK SCHEDULING DEMONSTRATION

SIX TASKS HAVE BEEN PRE-DEFINED FOR USE IN DEMONSTRATING THE SCHEDULING CAPABILITIES OF THE OPERATING SYSTEM. THIS DISPLAY CONTAINS COMPOSE FIELDS AND LIGHT PEN OPTIONS TO BE USED BY YOU IN SPECIFYING CERTAIN PARAMETERS AND ACTIVATING-STOPPING CERTAIN FUNCTIONS. THIS ENABLES YOU TO CONTROL THE DEMONSTRATION AND TO EXPERIMENT WITH VARIOUS TASK CONFIGURATIONS.

TASK	A	B	C	D	E	F
TYPE	PER	PER	PER	NON-PER	NON-PER	NON-PER
RATE	10 SEC	100 MIL	///	///		
PRIORITY	03	09	13	01	06	12
STATUS <*>	#	#	#	#	#	#
SCHEDULE	<A>	<B>	<C>	<D>	<E>	<F>
SUSPEND MINUTES	//	//	//	//	//	//
INDEF	<A>	<B>	<C>	<D>	<E>	<F>
DELETE	<A>	<B>	<C>	<D>	<E>	<F>
TERMINATE				<D>	<E>	<F>

TASK DATA #####

RETURN TO PRIOR LEVEL

(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES)

<\*>  
<\*>  
\*8900  
\*PREV  
\*SAME

DISPLAY 9050

-----NEXT DISPLAY NAMES-----

9050 SPECIAL DISPLAYS

SPECIAL DISPLAYS, CHARACTERIZED BY TAGS RANGING FROM 9000 - 9999, ARE UNIQUE IN THAT THEY MAY CONTAIN ONLY TEXT INFORMATION. NO COMPOSE FIELDS, TABULAR DATA, OR LIGHT PEN OPTIONS ARE PERMITTED IN THEM.

THEY ARE DISPLAYED FROM AN AUXILIARY BUFFER WHILE THE PRECEDING DISPLAY IS RETAINED IN THE COMPUTER FOR RE-DISPLAY WHEN THE OPERATOR USES THE LIGHT PEN TO RETURN TO PRIOR LEVEL. ALL DISPLAY INPUTS FROM EITHER THE KEYBOARD OR 840 APPLICATION PROGRAMS WILL BE USED TO UPDATE THE PRECEDING NORMAL DISPLAY RATHER THAN THE SPECIAL DISPLAY.

SPECIAL DISPLAYS ARE DESIGNED FOR USE WHEN IT IS NECESSARY TO EXPLAIN SOMETHING IN MORE DETAIL THAN IS POSSIBLE IN A ONE-LINE MESSAGE. PERHAPS AN ERROR CONDITION. THEY ARE LIMITED TO 12 LINES OF TEXT.

RETURN TO PRIOR LEVEL <\*> \*PREV  
(THIS LINE RESERVED FOR APPLICATION PROGRAM'S ONE LINE MESSAGES) <\*> \*SAME

5. CDA TASK LISTINGS

# SUBROUTINE DPT0

```

C
C FUNCTION:      ISSUES THE REQUEST FOR THE INITIAL DEMONSTRATION
C                DISPLAY(8900).  INITIALIZE PORTIONS OF THE CONTROL
C                TABLE USED IN THE TASK SCHEDULING SECTION OF THE
C                DEMONSTRATION.  (SEE DISPLAY 8951 AND TASK DTS0.)
C
C ENTRY CONDITIONS: SCHEDULED BY SYSTEM AS INITIAL TASK
C
C INPUTS:        NONE
C
C EXTERNAL CALLS:  MS23 (NEW DISPLAY REQUEST)
C
C EXIT:          MS06 - TERMINATE
C
      COMMON ITAB(6,6)
      DIMENSION NAME(6)
      DATA NAME(1),NAME(2),NAME(3),NAME(4),NAME(5),NAME(6)/
1      4HDTSA, 4HDTSB, 4HDTSC, 4HDTSD, 4HDTSE, 4HDTSF/
      DO 10 I = 1, 6
        ITAB(1,1) = 0
10      ITAB(1,3) = NAME(I)
        ITAB(1,4) = 2
        ITAB(1,5) = 10
        ITAB(2,4) = 1
        ITAB(2,5) = 100
        CALL MS23 (IRC, -2, 8900, 4HDTSD, $900)
        CALL MS06
900      CALL AREND(IRC,1)
      END

```

NO ERRORS



# SUBROUTINE DPT1

C  
 C FUNCTION:                INSERTS THE SPECIAL CHARACTERS <, >, / INTO DIS-  
 C                               PLAYS WHICH COULD NOT CONTAIN THEM ORIGINALLY  
 C                               BECAUSE OF THEIR SPECIAL SIGNIFICANCE TO THE  
 C                               LIBRARIAN AS PEN OPTION AND COMPOSE FIELD DEFINI-  
 C                               TION CHARACTERS.  
 C  
 C ENTRY CONDITIONS: CALLED BY TASK DPT2  
 C                               ACTIVATED FROM DISPLAY CONSOLE AS FOLLOWS  
 C                               .. OPTION 9 OF DISPLAY 8914  
 C                               .. OPTION 2 OF DISPLAY 8920  
 C                               .. OPTION 1 OF DISPLAY 8930  
 C                               .. OPTION 1 OF DISPLAY 8931  
 C  
 C INPUT:                    DISPLAY TAG AND OPTION NO./COMPOSE FIELD NO. TO  
 C                               IDENTIFY ACTIVATION SOURCE.  
 C  
 C EXTERNAL CALLS:        MS20 - TABULAR DATA DISPLAY REQUEST  
 C  
 C EXIT:                    MS06 - TERMINATE  
 C

COMMON /DXT1/IN(3)  
 ICDT = IN(1) + 1  
 N = 3  
 IF (IN(1) .EQ. 8920) ICDT = 8933  
 IF (ICDT .EQ. 8932) N = 2  
 CALL MS20 (IRC,ICDT,-1,N,3H<>/,\$900)  
 CALL MS06  
 900 CALL ABEND(IRC,2)  
 END

NO ERRORS

# SUBROUTINE DPT2

C  
 C FUNCTION: ACCEPTS COMPOSE FIELD INPUT DATA AND DISPLAYS IT  
 C VIA THE ONE-LINE MESSAGE FACILITY.  
 C  
 C ENTRY CONDITIONS: ACTIVATED FROM DISPLAY CONSOLE AS FOLLOWS.  
 C COMPOSE FIELDS 1-3 OF DISPLAY 8931  
 C COMPOSE FIELDS 1,2 OF DISPLAY 8932  
 C COMPOSE FIELDS 1-4 OF DISPLAY 8941  
 C  
 C INPUT: DISPLAY TAG, NO. OF INPUT WORDS FROM COMPOSE FIELD,  
 C AND COMPOSE FIELD CHARACTERS ENTERED BY OPERATOR.  
 C  
 C EXTERNAL CALLS: M\$22 - ONE-LINE MESSAGE DISPLAY REQUEST  
 C  
 C EXIT: M\$06 - TERMINATE  
 C DPT1  
 C

```

COMMON /DXT2/IN(50)/DXT1/INX(3)
DIMENSION MSG(50)
DATA MSG(1),MSG(2),MSG(3),MSG(4)/4HINPU,4HT RE,4HCEIV,4HED =/
I = IN(3)
DO 10 J = 1, I
10 MSG(J+4) = IN(J+3)
CALL M$22 (IRC,-1,-1,0,4*(I+4),MSG(1),$900)
IF (IN(1) .NE. 8932) CALL M$06
INX(1) = 8931
CALL DPT1
900 CALL ABEND(IRC,3)
END
  
```

NO ERRORS

# SUBROUTINE DPT3

C FUNCTION: ATTACHES OR DETACHES TASK DPT8 TO THE SPECIFIED  
 C FUNCTION SWITCH. THE FUNCTION PERFORMED FOR A  
 C GIVEN SWITCH DEPENDS ON THE CURRENT STATUS OF THE  
 C SWITCH. IF IT IS CURRENTLY ATTACHED, IT WILL BE  
 C DETACHED AND VICE VERSA.  
 C THIS MODULE ALSO DISPLAYS THE ATTACH/DETACH STATUS  
 C (1/0 RESPECTIVELY) FOR ALL 16 FUNCTION SWITCHES.  
 C ENTRY CONDITIONS: ACTIVATED FROM DISPLAY CONSOLE AS FOLLOWS.  
 C OPTION 3 OF DISPLAY 8920  
 C OPTION 1 OF DISPLAY 8933  
 C OPTION 1 OF DISPLAY 8944  
 C OPTION 1-16 OF DISPLAY 8934  
 C INPUT: DISPLAY TAG AND OPTION NUMBER  
 C EXTERNAL CALLS: MS20 - TABULAR DATA DISPLAY REQUEST  
 C MS24 - FUNCTION SWITCH ATTACH/DETACH  
 C EXIT: MS06 - TERMINATE

```

COMMON /DXT3/IN(3)
DIMENSION IFS(16),MFS(4)
DATA IFS(1),IFS(2),IFS(3),IFS(4),IFS(5),IFS(6),IFS(7),IFS(8),
1IFS(9),IFS(10),IFS(11),IFS(12),IFS(13),IFS(14),IFS(15),IFS(16)/
20.0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0/
DATA KC0,KC1,K4C0/1H0,1H1,4H0000/
IF (IN(1) .NE. 8934) GO TO 30
I = IN(2)
K = I/2
K1 = K + 1
IF (2*K .EQ. 1) K1 = K1 + 7
IF (IFS(I) .EQ. 0) GO TO 10
IFS(I) = 0
K1 = -K1
K2 = KC0
GO TO 20
10 IFS(I) = 1
K2 = KC1
20 CALL MS24 (4HDPT8, K1, $900)
CALL MS20 (IRC,8934,-1,1,K2,$900)
CALL MS06
30 DO 35 I = 1, 4
35 MFS(I) = K4C0 + IFS(4*I-3)*2**18 + IFS(4*I-2)*2**12
1 + IFS(4*I-1)*2**6 + IFS(4*I)
CALL MS20 (IRC, 8934, -1, 16, MFS(1), $900)
CALL MS06
900 CALL ABEND(IRC,4)
END
  
```

NO ERRORS

# SUBROUTINE DPT4

```

C
C FUNCTION:      RESPONDS TO DISPLAY CONSOLE COMMANDS AS FOLLOWS.
C                1. ISSUES TABULAR DATA DISPLAY REQUESTS FOR
C                   DISPLAY 8940.
C                2. ISSUES CURSOR MOVE REQUESTS FOR DISPLAY
C                   8941.
C                3. ISSUES A ONE-LINE MESSAGE REQUEST FOR
C                   DISPLAY 8942.
C                4. ISSUES A NEW DISPLAY REQUEST FOR DISPLAY
C                   8943.
C
C ENTRY CONDITIONS: ACTIVATED FROM DISPLAY CONSOLE AS FOLLOWS.
C                   OPTIONS 6,7 OF DISPLAY 8920
C                   OPTIONS 1-3 OF DISPLAY 8940
C                   COMPOSE FIELD 1 OF DISPLAY 8940
C                   OPTIONS 1-5 OF DISPLAY 8941
C                   ONE-LINE MESSAGE OPTION OF DISPLAY 8942
C
C INPUT:         DISPLAY TAG AND OPTION NUMBER
C
C EXTERNAL CALLS: MS20 - TABULAR DATA DISPLAY REQUEST
C                 MS21 - CURSOR MOVE DISPLAY REQUEST
C                 MS22 - ONE-LINE MESSAGE DISPLAY REQUEST
C                 MS23 - NEW DISPLAY REQUEST
C
C EXIT:          MS06 - TERMINATE
C
C
C      COMMON /DXT4/IN(6)
C      IF (IN(1) .EQ. 8941 .AND. IN(2) .LE. 4) GO TO 100
C      IF (IN(1) .EQ. 8941 .AND. IN(2) .EQ. 5 .OR. IN(1) .EQ. 8920 .AND.
1 IN(2) .EQ. 6) GO TO 200
C      IF (IN(1) .EQ. 8942 .OR. IN(1) .EQ. 8920 .AND. IN(2) .EQ. 7)
1 GO TO 300
C      I = IN(2)
C      IF (IN(3) .EQ. 0) GO TO (10,20,30), I
C      WRITE (0,1) IN(4)
1  FORMAT (A2)
C      READ (0,2) N
2  FORMAT (I2)
C      CALL MS20 (IRC, 8940, -N, 5, IN(5), $900)
C      GO TO 40
10  CALL MS20 (IRC,8940,3,3,3HABC,$900)
C      GO TO 40
20  CALL MS20 (IRC,8940,0,0,0,$900)
C      GO TO 40
30  CALL MS20 (IRC,8940,-5,3,3HXYZ,$900)
40  CALL MS06
100  CALL MS21 (IRC,8941,IN(2),$900)
C      CALL MS06
200  CALL MS22 (IRC,8942,8943,4HDPT4,72,72HAPPLICATION PROGRAM MESSAGE,
1  SELECT OPTION AT RIGHT TO CONTINUE TO 8943 , $900)
C      CALL MS06
300  CALL MS23 (IRC,8943,8944,0,$900)
C      CALL MS06
900  CALL ABEND(IRC,5)
C      END

```

NO ERRORS

SUBROUTINE DPT8

C  
C FUNCTION: DETERMINES WHICH FUNCTION SWITCH ACTIVATED IT AND  
C DISPLAYS AN APPROPRIATE ONE-LINE MESSAGE WHICH  
C IDENTIFIES THE SWITCH.  
C  
C INPUT: FUNCTION SWITCH SETTING  
C  
C ENTRY CONDITIONS: SCHEDULED IN RESPONSE TO THE SETTING OF ANY ATTACH-  
C ED CONSOLE FUNCTION SWITCH.  
C  
C EXTERNAL CALLS: MS22 - ONE-LINE MESSAGE DISPLAY REQUEST  
C  
C EXIT: MS06 - TERMINATE  
C

COMMON /DXT8/IN(3)  
DIMENSION M(8)  
DATA M(1),M(2),M(3),M(4),M(6),M(7),M(8)/4HFUNC,4HTI0N,4H SWI,4HTCH  
1 ,4HAS B,4HEEN ,4HSET /  
DATA J/4H00 H/  
I = - IN(2)  
IF (I .GT. 9) I = I - 10 + 2\*\*6  
M(5) = J + I\*2\*\*12  
CALL MS22 (IRC, -1, -1, 0, 32, M(1), \$900)  
CALL MS06  
900 CALL ABEND(IRC,6)  
END

NO ERRORS

# SUBROUTINE DTSO

```

C
C FUNCTION:      INITIALIZE THE CONTROL TABLE USED IN THE TASK
C                SCHEDULING PORTION OF THE DEMONSTRATION,
C                IF ANY OF THE TASKS CONTROLLED VIA THE TABLE ARE
C                NOT INACTIVE, THEY ARE DELETED.
C                THE TABLE CONTAINS THE FOLLOWING ITEMS FOR EACH OF
C                THE SIX TASKS USED TO DEMONSTRATE TASK SCHEDULING
C                FACILITIES.
C                1. TASK CURRENT STATUS (NOT SYSTEM STATUS)
C                  +1 ACTIVE
C                  0 INACTIVE
C                  -1 SUSPENDED
C                2. SUSPENSION PERIOD IN MINUTES(0 = INDEFINITE)
C                3. TASK NAME
C                4. PERIODIC TASK RATE UNITS
C                  1 MILLISECONDS
C                  2 SECONDS
C                  3 MINUTES
C                5. PERIODIC TASK RATE
C                6. EXECUTION PASS COUNT
C
C ENTRY CONDITIONS: SCHEDULED IN RESPONSE TO OPTION 4 OF DISPLAY 8900.
C                  SCHEDULED IN RESPONSE TO OPTION 23 OF DISPLAY 8951.
C                  SCHEDULED AS A RESULT OF THE IMMEDIATE-MODE NEW
C                  DISPLAY REQUEST ISSUED BY DPT0.
C
C INPUT:          NONE
C
C EXTERNAL CALLS: MS05 - DELETE TASK
C
C EXIT:           MS06 - TERMINATE
C

```

```

COMMON ITAB(6,6)
COMMON /DXSO/IN(3)
IF (IN(1) .EQ. 8900 .AND. IN(2) .EQ. 4) CALL EXIT
DO 10 I = 1, 6
  ITAB(I,6) = 0
  IF (ITAB(I,1) .EQ. 0) GO TO 10
  ITAB(I,1) = 0
  CALL MS05 (ITAB(I,3), IRC, $100)
  GO TO 10
100 IF (IRC .EQ. 1) GO TO 900
10 CONTINUE
  ITAB(3,4) = 3
  ITAB(3,5) = 1
  CALL MS06
900 CALL ABEND(IRC,7)
END

```

NO ERRORS

# SUBROUTINE DTS1

C  
C FUNCTION: SERVICES THE OPTION SELECTIONS FOR THE TASK SCHEDU-  
C LING DISPLAY (8951) AS FOLLOWS.  
C 1. FOR OPTION 1 OBTAINS AND DISPLAYS THE  
C SYSTEM STATUS FOR ALL 6 SAMPLE TASKS.  
C 2. FOR OPTIONS 2-7 SCHEDULES THE SPECIFIED  
C TASK FOR EXECUTION.  
C 3. FOR OPTIONS 8-13 SETS THE CONTROL TABLE  
C ENTRY FOR THE SPECIFIED TASK TO CAUSE THE  
C TASK TO SUSPEND ITSELF INDEFINITELY.  
C 4. FOR OPTIONS 14-19 DELETES THE SPECIFIED  
C TASK.  
C 5. FOR OPTIONS 20-22 SETS THE CONTROL TABLE  
C ENTRY FOR THE SPECIFIED TASK TO CAUSE THE  
C TASK TO TERMINATE ITSELF.  
C  
C ENTRY CONDITIONS: SCHEDULED IN RESPONSE TO OPTIONS 1-27 OF DISPLAY  
C 8951.  
C  
C INPUT: OPTION NUMBER  
C  
C EXTERNAL CALLS: M\$01 - SCHEDULE PERIODIC TASK  
C M\$02 - SCHEDULE NON-PERIODIC TASK  
C M\$05 - DELETE TASK  
C M\$07 - CHECK TASK STATUS  
C M\$20 - TABULAR DATA DISPLAY REQUEST  
C  
C EXIT: M\$06 - TERMINATE  
C

COMMON ITAB(6,6)  
COMMON /DTS1/IN(3)  
DIMENSION JST(6),MST(3)  
DATA KST/4H0000/  
I = 1 + (IN(2) + 4)/6  
J = IN(2) - 6\*(I - 1) + 5  
GO TO (100, 200, 300, 400, 500), I  
100 DO 110 I = 1, 6  
CALL M\$07 (ITAB(I,3),IST,\$900)  
110 JST(I) = 64\*(IST/8) + IST - 8\*(IST/8)  
DO 120 I = 1, 3  
120 MST(I) = KST + 2\*12\*JST(2\*I-1) + JST(2\*I)  
CALL M\$20 (IRC, 8951, -1, 12, MST(1), \$900)  
CALL M\$06  
200 IF (J .GT. 3) GO TO 250  
CALL M\$01 (ITAB(J,3),ITAB(J,4),ITAB(J,5),1,IRC,\$270)  
GO TO 260  
250 CALL M\$02 (ITAB(J,3),IRC,\$270)  
260 ITAB(J,1) = 1  
GO TO 100  
270 IF (IRC .EQ. 2) GO TO 100  
GO TO 900  
300 ITAB(J,1) = -1  
ITAB(J,2) = 0  
GO TO 100  
400 CALL M\$05 (ITAB(J,3),IRC,\$490)  
410 ITAB(J,1) = 0  
GO TO 100

```
490 IF (IRC .EQ. 1) GO TO 900
    GO TO 410
500 ITAB (J+3,1) = 0
    GO TO 100
900 CALL ABEND(IRC,8)
    END
```

NO ERRORS



# SUBROUTINE DTS2

C  
C FUNCTION: PROCESS THE COMPOSE FIELD INPUT FOR THE TASK SCHED-  
C ULING DISPLAY (8951) AS FOLLOWS.  
C 1. FOR COMPOSE FIELD 1 SETS THE PERIODIC RATE  
C AND UNITS IN THE CONTROL TABLE ENTRY FOR  
C TASK DTSC.  
C 2. FOR COMPOSE FIELDS 2-7 SETS THE CONTROL  
C TABLE ENTRY FOR THE CORRESPONDING TASK TO  
C CAUSE THE TASK TO SUSPEND ITSELF FOR THE  
C SPECIFIED NUMBER OF MINUTES.  
C  
C ENTRY CONDITIONS: SCHEDULED IN RESPONSE TO COMPOSE FIELDS 1-7 OF  
C DISPLAY 8951.  
C  
C INPUT: COMPOSE FIELD NUMBER AND DATA ENTERED BY OPERATOR.  
C  
C EXTERNAL CALLS: NONE  
C  
C EXIT: MS06 - TERMINATE  
C

```

COMMON ITAB(6,6)
COMMON /DTS2/IN(5)
DIMENSION KUNIT(3)
DATA KUNIT(1),KUNIT(2),KUNIT(3)/4HMIL ,4HSEC ,4HMIN /
IF (IN(2) .GT. 1) GO TO 100
DO 10 I = 1, 3
IF (IN(5) .EQ. KUNIT(I)) GO TO 20
10 CONTINUE
20 ITAB(3,4) = 1
WRITE (0,30) IN(4)
30 FORMAT (A3)
READ (0,40) ITAB(3,5)
40 FORMAT (I3)
CALL MS06
100 I = IN(2) - 1
ITAB(I,1) = -1
WRITE (0,110) IN(4)
110 FORMAT (A2)
READ (0,120) ITAB(I,2)
120 FORMAT (I2)
CALL MS06
END

```

NO ERRORS

# SUBROUTINE DTSA

```

C
C      TASK SCHEDULING DEMONSTRATION DUMMY TASK
C
C TASK TYPE:          PERIODIC, RATE = 10 SECONDS
C
C FUNCTION:           INCREMENTS AN EXECUTION PASS COUNT AND DISPLAYS
C                     THIS COUNT IN THE PROPER "TASK DATA" FIELD OF
C                     DISPLAY 8951.
C                     IF THE CONTROL TABLE INDICATES THAT THE TASK IS TO
C                     BE SUSPENDED, IT SUSPENDS ITSELF FOR THE SPECIFIED
C                     NUMBER OF MINUTES OR INDEFINITELY.
C                     IF AN ERROR RETURN CODE INDICATES THAT DISPLAY 8951
C                     IS NO LONGER ACTIVE, THE TASK WILL DELETE ITSELF.
C
C ENTRY CONDITIONS:   SCHEDULED BY TASK DTS1.
C
C INPUT:              NONE
C
C EXTERNAL CALLS:     MS20 - TABULAR DATA DISPLAY REQUEST
C                     MS05 - DELETE TASK
C                     MS10 - SUSPEND TASK INDEFINITELY
C                     MS12 - SUSPEND TASK FOR A SPECIFIED TIME
C
C EXIT:               MS06 - TERMINATE
C

```

```

      COMMON ITAB(6,6)
      DIMENSION IKOUNT(2)
      I = 1
      ITAB(I,6) = ITAB(I,6) + 1
      WRITE (0,10) ITAB(I,6)
10  FORMAT (I8)
      READ (0,20) IKOUNT
20  FORMAT (2A4)
      CALL MS20 (IRC,8951,-5-8*I,8,IKOUNT(1),$500)
      IF (ITAB(I,1)) 100, 200, 200
100 IF (ITAB(I,2) ,EQ. 0) GO TO 150
      CALL MS12 (3, ITAB(I,2))
      GO TO 160
150 CALL MS10
160 IF (ITAB(I,1) .LT. 0) ITAB(I,1) = 1
200 CALL MS06
500 IF (IRC .NE. 1) GO TO 900
      CALL MS05 (ITAB(I,3), IRC, $590)
510 ITAB(I,1) = 0
      CALL MS06
590 IF (IRC .NE. 1) GO TO 510
900 CALL ABEND(IRC,9)
      END

```

NO ERRORS

SUBROUTINE DISB

C  
C TASK SCHEDULING DEMONSTRATION DUMMY TASK  
C  
C TASK TYPE: PERIODIC, RATE = 100 MILLI-SECONDS  
C  
C FUNCTIONALLY, THIS TASK IS THE SAME AS DISA  
C

```

COMMON ITAB(6,6)
DIMENSION IKOUNT(2)
I = 2
ITAB(I,6) = ITAB(I,6) + 1
WRITE (0,10) ITAB(I,6)
10 FORMAT (I8)
READ (0,20) IKOUNT
20 FORMAT (2A4)
CALL M$20 (IRC,8951,-5-8*I,8,IKOUNT(1),$500)
IF (ITAB(I,1)) 100, 200, 200
100 IF (ITAB(I,2) .EQ. 0) GO TO 150
CALL M$12 (3, ITAB(I,2))
GO TO 160
150 CALL M$10
160 IF (ITAB(I,1) .LT. 0) ITAB(I,1) = 1
200 CALL M$06
500 IF (IRC .NE. 1) GO TO 900
CALL M$05 (ITAB(I,3), IRC, $590)
510 ITAB(I,1) = 0
CALL M$06
590 IF (IRC .NE. 1) GO TO 510
900 CALL ABEND(IRC,10)
END

```

NO ERRORS

SUBROUTINE DTSC

C  
C TASK SCHEDULING DEMONSTRATION DUMMY TASK  
C  
C TASK TYPE: PERIODIC, RATE = 1 MINUTE (DEFAULT)  
C  
C FUNCTIONALLY, THIS TASK IS THE SAME AS DTSA  
C

```

COMMON ITAB(6,6)
DIMENSION IKOUNT(2)
I = 3
ITAB(I,6) = ITAB(I,6) + 1
WRITE (0,10) ITAB(I,6)
10 FORMAT (I8)
READ (0,20) IKOUNT
20 FORMAT (2A4)
CALL M$20 (IRC,8951,-5-8*I,8,IKOUNT(1),$500)
IF (ITAB(I,1)) 100, 200, 200
100 IF (ITAB(I,2) .EQ. 0) GO TO 150
CALL M$12 (3, ITAB(I,2))
GO TO 160
150 CALL M$10
160 IF (ITAB(I,1) .LT. 0) ITAB(I,1) = 1
200 CALL M$06
500 IF (IRC .NE. 1) GO TO 900
CALL M$05 (ITAB(I,3), IRC, $590)
510 ITAB(I,1) = 0
CALL M$06
590 IF (IRC .NE. 1) GO TO 510
900 CALL AREND(IRC,11)
END

```

NO ERRORS

# SUBROUTINE DTSD

```

C
C      TASK SCHEDULING DEMONSTRATION DUMMY TASK
C
C TASK TYPE:          NON-PERIODIC
C
C FUNCTION:           INCREMENTS AN EXECUTION PASS COUNT AND DISPLAYS
C                     THIS COUNT IN THE PROPER "TASK DATA" FIELD OF
C                     DISPLAY 8951.
C                     IF THE CONTROL TABLE INDICATES THAT THE TASK IS TO
C                     BE SUSPENDED, IT SUSPENDS ITSELF FOR THE SPECIFIED
C                     NUMBER OF MINUTES OR INDEFINITELY.
C                     IF AN ERROR RETURN CODE INDICATES THAT DISPLAY 8951
C                     IS NO LONGER ACTIVE, THE TASK WILL TERMINATE.
C                     IF THE CONTROL TABLE INDICATES THAT THE TASK IS TO
C                     BE DELETED, IT WILL TERMINATE ITSELF.
C
C ENTRY CONDITIONS:   SCHEDULED BY TASK DTS1.
C
C INPUT:              NONE
C
C EXTERNAL CALLS:     MS20 - TABULAR DATA DISPLAY REQUEST
C                     MS10 - SUSPEND TASK INDEFINITELY
C                     MS12 - SUSPEND TASK FOR A SPECIFIED TIME
C
C EXIT:               MS06 - TERMINATE
C

```

```

      COMMON ITAB(6,6)
      DIMENSION IKOUNT(2)
      I = 4
1    ITAB(I,6) = ITAB(I,6) + 1
      WRITE (0,10) ITAB(I,6)
10   FORMAT (I8)
      READ (0,20) IKOUNT
20   FORMAT (2A4)
      CALL MS20 (IRC,8951,-5-8*I,8,IKOUNT(1),5500)
      IF (ITAB(I,1)) 100, 200,1
100  IF (ITAB(I,2) .EQ. 0) GO TO 150
      CALL MS12 (3, ITAB(I,2))
      GO TO 160
150  CALL MS10
160  IF (ITAB(I,1) .LT. 0) ITAB(I,1) = 1
      GO TO 1
500  IF (IRC .NE. 1) GO TO 900
      ITAB(I,1) = 0
200  CALL MS06
900  CALL ABEND(IRC,12)
      END

```

NO ERRORS

SUBROUTINE DTSE

C  
C TASK SCHEDULING DEMONSTRATION DUMMY TASK  
C  
C TASK TYPE: NON-PERIODIC  
C  
C FUNCTIONALLY, THIS TASK IS THE SAME AS DTSD  
C

```

COMMON ITAB(6,6)
DIMENSION IKOUNT(2)
I = 5
1 ITAB(I,6) = ITAB(I,6) + 1
WRITE (0,10) ITAB(I,6)
10 FORMAT (I8)
READ (0,20) IKOUNT
20 FORMAT (2A4)
CALL MS20 (IRC,8951,-5-8*I,8,IKOUNT(1),$500)
IF (ITAB(I,1)) 100, 200, 1
100 IF (ITAB(I,2) .EQ. 0) GO TO 150
CALL MS12 (3, ITAB(I,2))
GO TO 160
150 CALL MS10
160 IF (ITAB(I,1) .LT. 0) ITAB(I,1) = 1
GO TO 1
500 IF (IRC .NE. 1) GO TO 900
ITAB(I,1) = 0
200 CALL MS06
900 CALL ABEND(IRC,13)
END

```

NO ERRORS

```

SUBROUTINE DTSE
C
C      TASK SCHEDULING DEMONSTRATION DUMMY TASK
C
C TASK TYPE:          NON-PERIODIC
C
C FUNCTIONALLY, THIS TASK IS THE SAME AS DTSD
C
COMMON ITAB(6,6)
DIMENSION IKOUNT(2)
I = 6
1 ITAB(I,6) = ITAB(I,6) + 1
WRITE (0,10) ITAB(I,6)
10 FORMAT (I8)
READ (0,20) IKOUNT
20 FORMAT (2A4)
CALL MS20 (IRC,8951,-5-8*I,8,IKOUNT(1),$500)
IF (ITAB(I,1)) 100, 200, 1
100 IF (ITAB(I,2) .EQ. 0) GO TO 150
CALL MS12 (3, ITAB(I,2))
GO TO 160
150 CALL MS10
160 IF (ITAB(I,1) .LT. 0) ITAB(I,1) = 1
GO TO 1
500 IF (IRC .NE. 1) GO TO 900
ITAB(I,1) = 0
200 CALL MS06
900 CALL ABEND(IRC,14)
END

```

NO ERRORS

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APPENDIX A - CDA Display Librarian Input Control Cards

N,8900  
P,8910  
P,8920  
P,8950  
P,SAME,DTSO

\*T

T,8900

## MULTI-PROCESSOR CONTROL SYSTEM

T,

T,

### MPCS DEMONSTRATION

T,

T,MPCS HAS BEEN DESIGNED TO PROVIDE FACILITIES FOR CONCURRENT EXECUTION  
T,OF JOB COMPONENTS(TASKS) BY MULTIPLE PROCESSORS. THESE FACILITIES  
T,INCLUDE SYSTEM SERVICES FOR TASK CONTROL, CROSS-PROCESSOR COMMUNICATI  
T,ON,

T,AND CRT DISPLAY SUPPORT IN ADDITION TO THE CAPABILITIES PROVIDED BY  
T,THE CHANE OPERATING SYSTEM.

T,

T,THIS DEMONSTRATION HAS BEEN ORGANIZED INTO SEVERAL SECTIONS EACH OF  
T,WHICH CAN BE USED INDEPENDENTLY BY SELECTING THE APPROPRIATE LIGHT PEX

T,N

T,OPTION BELOW.

T,

T,

<\*> DISPLAY LIBRARY GENERATION FACILITIES

T,

T,

<\*> REAL-TIME DISPLAY FACILITIES

T,

T,

<\*> OPERATING SYSTEM FACILITIES

T,

T,

T,

T,

T,

T,

T,NOTE - IN ORDER TO SELECT AN OPTION, TOUCH THE LIGHT PEN BEAM TO ONE  
T,OF THE ASTERISK SYMBOLS AND DEPRESS THE BUTTON ON THE SIDE OF  
T,THE LIGHT PEN,

T,

T,

T,

T,

<\*> TERMINATE DEMONSTRATION

END

SSSSSS DISPLAY 8900 HAS BEEN ADDED TO LIBRARY SSSSSS

N,8910

P,8911

\*T

I,8910

## DISPLAY LIBRARY GENERATION FACILITIES

I,

I,

T,THERE ARE FOUR BASIC STEPS IN GENERATING THE DISPLAY LIBRARY  
I,FOR APPLICATION PROGRAMS.

I,

I, 1. DEFINE THE DISPLAYS NECESSARY FOR THE APPLICATION OR APPLICATIONS.

I,

I, 2. USING THE DISPLAY LIBRARIAN LANGUAGE(DLL), CODE THE DISPLAY  
I, FORMATTING INFORMATION AND PUNCH THIS INFORMATION IN SOURCE CARDS.

I,

I, 3. INPUT THE SOURCE CARDS TO THE DISPLAY LIBRARIAN PROGRAM WHICH IN  
I,N

I, TURN WILL CREATE A MAGNETIC TAPE CONTAINING THE DISPLAY LIBRARY

I,

I, 4. TRANSFER THE DISPLAY LIBRARY FROM MAGNETIC TAPE (HARD STORAGE)  
I, TO THE 8100 DISK FOR ON-LINE EXECUTION.

I,

I,THE DISPLAY LIBRARY IS CREATED BY THE DISPLAY LIBRARIAN PROGRAM USING  
I,THE DLL CODED INPUT. DLL IS AN EASY TO USE CODING LANGUAGE CONSISTING  
I,G

I,OF ELEVEN OPERATORS.

I,

I, THEY ARE-

I,

I, 1. OUTPUT OPTION -O-	5. COMPOSE -C-	9. TEXT -T-
I, 2. INPUT OPTION -I-	6. LEGALITY -X-	10. END -E-
I, 3. NAME -N-	7. LINE -L-	11. DELETE -D-
I, 4. PEN -P-	8. TEXT CONTROL -*-	

I,

I,

I,DISPLAY 8911 GIVES A FUNCTIONAL EXPLANATION OF THESE SOURCE RECORDS.

I,

I,

<SELECT 8911>

END

\$\$\$\$\$ DISPLAY 8910 HAS BEEN ADDED TO LIBRARY \$\$\$\$\$

N,8911

P,8912

\*T

I,8911

# DISPLAY LIBRARIAN LANGUAGE SOURCE RECORDS

I,

I,

I,DLL SOURCE RECORDS ARE OF THREE TYPES.

I,

I,

I, 1. RECORDS REQUIRED TO INPUT PROGRAM OPTION SELECTIONS AND CONTRX

I,NL

I, PARAMETERS TO THE LIBRARIAN PROGRAM. RECORDS OF THIS TYPE ARE  
I, THE- OUTPUT OPTION, INPUT OPTION, NAME, TEXT CONTROL, END, ANX

I,D

I, DELETE RECORDS.

I,

I, 2. CONTROL PAGE RECORDS WHICH CONTAIN CONTROL INFORMATION REQUIR

I,ED

I, FOR EXECUTION OF THE DISPLAY OPTIONS BY THE ON-LINE DISPLAY  
I, PROGRAM. THE DISPLAY OPTIONS FOR WHICH CONTROL INFORMATION IS  
I, INPUT BY THESE RECORDS ARE- KEYBOARD DATA ENTRY, LIGHT PEN OPX

I,TION,

I, AND LINE VECTOR DISPLAY. RECORDS OF THIS TYPE ARE THE- PEN,  
I, COMPOSE, LEGALITY, AND LINE RECORDS.

I,

I, 3. TEXT RECORDS WHICH DEFINE THE DATA THAT IS TO APPEAR ON THE  
I, DISPLAY. TEXT RECORDS ALSO DEFINE THE AREAS ON THE DISPLAY  
I, WHERE THE DISPLAY OPTIONS ARE TO APPEAR, AND THEY CONTAIN DATA  
I, TO DEFINE APPLICATION PROGRAM FILL-IN AREAS ON THE DISPLAY.

I,

I,

I,DISPLAYS 8912-8915 GIVE FORMAT ILLUSTRATIONS OF THE DLL SOURCE RECORDX

I,S.

I,

I,

END

<SELECT 8912>

\$\$\$\$\$\$ DISPLAY 8911 HAS BEEN ADDED TO LIBRARY \$\$\$\$\$\$

N,8912

P,9050

P,8913

\*T

T,8912      DISPLAY LIBRARIAN LANGUAGE - SOURCE RECORD FORMATS -1-

T,

T,

T,THE CODED DLL SOURCE RECORDS ARE INPUT TO THE DISPLAY LIBRARIAN  
PROGRAM ON 80 COLUMN PUNCHED CARDS AND EACH RECORD REQUIRES AN  
IDENTIFIER CHARACTER IN CARD COLUMN 1.

T,

T,

T,    OUTPUT OPTION CARD -0-

T,    0,S,P,L

- OPTIONAL CONTROL CARD, IF NOT INCLUDED  
IN INPUT DECK THE DISPLAY LIBRARIAN WILL  
ASSUME THE 'P' OPTION WAS SELECTED.

T,

T,

T,

- S=LIST SOURCE CARDS  
- P=OUTPUT PRINTED DISPLAYS TO LINE PRINTER  
- L=WRITE-ADD DISPLAYS TO DISPLAY LIBRARY

T,

T,    INPUT OPTION CARD -1-

T,    1,T

- INPUT NORMALLY IS FROM CARDS, FOR CARD IMAGE

T,E

T,

MAGNETIC TAPE INPUT, THIS OPTION CARD IS USED

T,ED.

T,

T,    NAME CARD -N-

T,    N,XXXX

- XXXX IS THE DISPLAY NAME TAG. IT CAN BE ANY FOUR  
DIGIT NUMBER FROM 0001 THROUGH 9999. DISPLAY NAME  
TAGS FROM 0001 THROUGH 8999 WILL BE USED FOR NORMAL  
DISPLAYS AND DISPLAY NAME TAGS FROM 9000 THROUGH  
9999 WILL BE USED FOR SPECIAL DISPLAYS.  
FOR A DESCRIPTION OF SPECIAL DISPLAYS, SELECT THE  
9050 PEN OPTION WHICH FOLLOWS <SELECT 9050>.

T,

T,FOR FORMAT ILLUSTRATIONS OF THE REMAINING DLL SOURCE RECORDS SELECT  
T,8913.

T,

<SELECT 8913>

END

\$\$\$\$\$ DISPLAY 8912 HAS BEEN ADDED TO LIBRARY \$\$\$\$\$

```

N,8913
P,8914
*
T,8913    DISPLAY LIBRARIAN LANGUAGE - SOURCE RECORD FORMATS -2-
T,
T,
T,  PEN CARD -P-
T,  P,XXXX,YYYY - XXXX=NAME TAG OF THE DISPLAY TO BE LOADED WHEN THE OPTIØN
T,PTION
T,
T,                IS SELECTED. 0001-9999
T,                'SAME' WILL CAUSE THE CURRENT DISPLAY TO BE RETX
T,AINED.
T,                'PREV' WILL CAUSE THE PREVIOUS DISPLAY TO BE REL
T,LOADED
T,                YYYY=NAME OF THE TASK TO BE SCHEDULED WHEN THE OPTIØX
T,N
T,                IS SELECTED. THIS PARAMETER IS OPTIØNAL.
T,
T,  COMPØSE CARD -C-
T,  C,UU,VV,XXXX,YYYY - UU=NUMBER OF SUBFIELDS IN THIS COMPØSE FIELD,
T,                        CAN BE A ØNE ØR TWO DIGIT NUMBER
T,                        VV=NUMBER OF CHARACTERS IN THIS COMPØSE FIELD,
T,                        CAN BE A ØNE ØR TWO DIGIT NUMBER
T,                        XXXX=NEXT DISPLAY NAME TAG *SAME AS PEN CARD*
T,                        YYYY=NEXT TASK NAME *SAME AS PEN CARD EXCEPT IT
T,                        IS REQUIRED FOR THE COMPØSE CARD*
T,
T,  LEGALITY CARD -X-
T,  X(L1|1R1)(L2|2R2)....(LN|NRN) - L=NUMBER OF RESTRICTION CHARACTERS
T,                                     - T=TYPE OF RESTRICTION DATA
T,                                     Ø=ØCTAL B=BINARY D=DECIMAL
T,                                     A=ALPHABETIC X= NO CHECKING
T,                                     S=SPECIAL-DEFINITION OF SPECIAL
T,                                     CHARACTERS WILL BE SHØWN IN
T,                                     ØN-LINE DISPLAY FACILITIES, DIS
T,SPLAY
T,
T,                                     8931
T,                                     - R=RESTRICTION DATA -EXPLICIT MAGNITX
T,UDE,
T,                                     MAGNITUDE RANGE, ØR ØØTH ALLOWED
T,
T,FORMAT ILLUSTRATIONS CØNTINUE ØN DISPLAY 8914.
T,
T,                                     <SELECT 8914>
END

```

\$\$\$\$\$ DISPLAY 8913 HAS BEEN ADDED TO LIBRARY \$\$\$\$\$\$



41

7.

7.

i,

I.

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1.

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16

T.

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!

EN



N,8920  
P,8930  
P,8933,DPT1  
P,8934,DPT3  
P,8940  
P,8941  
P,8942,DPT4  
P,8943,DPT4  
P,8944

\*T

I,8920

## DISPLAY FACILITIES

I,

I,

I, DISPLAY CONSOLE OPERATOR CONTROL CAPABILITIES

I,

I, <\*> KEYBOARD DATA ENTRY

T,

I, <\*> LIGHT PEN OPTION SELECTION

I,

I, <\*> FUNCTION SWITCH PROGRAM ACTIVATION

I,

T,

I, APPLICATION PROGRAM DISPLAY CAPABILITIES

I,

T, <\*> TABULAR DATA (FILL-IN) DISPLAY

T,

I, <\*> DATA CURSOR CONTROL

I,

I, <\*> ONE-LINE MESSAGE DISPLAY

T,

T, <\*> NEW DISPLAY REQUEST

I,

T, <\*> FUNCTION SWITCH ATTACH-DETACH

I,

I,

I, TO OBTAIN DETAILED ILLUSTRATIONS OF ANY OF THESE FACILITIES, USE THE  
I, LIGHT PEN TO SELECT THE APPROPRIATE OPTION.

END

\$\$\$\$\$ DISPLAY 8920 HAS BEEN ADDED TO LIBRARY \$\$\$\$\$\$

N,8930

P,8931,DPT1

\*T

T,8930

# DISPLAY FACILITIES - KEYBOARD DATA ENTRY

T,  
T,THE CONSOLE KEYBOARD CAN BE USED TO ENTER DATA INTO PRE-DEFINED COMPOSE  
T,SE

T,FIELDS IN A DISPLAY AND TO CAUSE THE ENTERED DATA TO BE PASSED TO AN  
T,APPLICATION PROGRAM FOR PROCESSING.

T,  
T,THE COMPOSE FIELDS APPEAR ON THE SCREEN AS SLASH CHARACTERS. THEY ARE  
T,E

T,REPLACED WITH INPUT DATA AS IT IS RECEIVED. A DATA CURSOR APPEARS ON  
T,THE SCREEN TO INDICATE WHERE THE NEXT INPUT CHARACTER WILL BE PLACED.

T,IT CAN BE POSITIONED AT ANY COMPOSE FIELD CHARACTER DESIRED BY THE  
T,OPERATOR.

T,  
T,AFTER ALL DESIRED DATA HAS BEEN ENTERED FOR A GIVEN COMPOSE FIELD, THE  
T,E

T,OPERATOR CAN USE THE "RETURN" KEY TO PASS THE DATA TO AN APPLICATION  
T,PROGRAM. WHEN THE "RETURN" KEY IS DEPRESSED, THE TASK ASSOCIATED WITH

T,H  
T,THE COMPOSE FIELD IS SCHEDULED FOR EXECUTION IN THE 840 AND ONE OF THE  
T,E

T,FOLLOWING WILL APPEAR ON THE SCREEN DEPENDING ON HOW THE COMPOSE FIELD  
T,D

T,WAS DEFINED.

T,

T,

1. A NEW DISPLAY

T,

T,

2. THE SAME DISPLAY (REFRESHED TO ORIGINAL FORM)

T,

T,

3. THE SAME DISPLAY (UNREFRESHED)

T,

T,

T,

T,

T,

T,

T,

T,

END

<CONX

T,INUE>

\$\$\$\$\$ DISPLAY 8930 HAS BEEN ADDED TO LIBRARY \$\$\$\$\$

N,8931  
P,8932,DPT1  
C,3,9,SAME,DPT2  
C,2,5,SAME,DPT2  
C,5,5,SAME,DPT2

\*T

T,8931 DISPLAY FACILITIES - KEYBOARD DATA ENTRY

T,

T, DATA CURSOR CONTROL IS PROVIDED THROUGH THE USE OF SEVERAL SPECIAL KEYS

T,YS.

KEY	FUNCTION
SEMI-COLON	CURSOR RIGHT
DELETE	CURSOR LEFT
COLON	CURSOR UP
LINE FEED	CURSOR DOWN
"AT" SIGN	CURSOR HOME (FIRST COMPOSE FIELD)

T,

T, THE VALID DATA ENTRY KEYS INCLUDE

ALPHABETIC	A-Z
NUMERIC	0-9
SPECIAL	, . ? ' " ( ) # # = + - * # # BLANK

T, ALL OTHER CHARACTERS WILL BE IGNORED.

T,

T, USE THE FOLLOWING SAMPLE COMPOSE FIELDS TO GET THE FEEL OF DATA ENTRY

T, AND CURSOR MANIPULATION.

T,

COMPOSE FIELD A	DATE = /// // /// (MONTH DAY YEAR)
COMPOSE FIELD B	VELOCITY = ///./// (FEET PER SECOND)
COMPOSE FIELD C	//
	/
	//

T,

T, THE DATA YOU HAVE ENTERED WILL BE RE-DISPLAYED IN THE ONE-LINE MESSAGE

T, E

T, AT THE BOTTOM OF THE SCREEN.

T,

T, IT SHOULD BE NOTED THAT ONLY ONE COMPOSE FIELD CAN BE PROCESSED AT A TIME. WHENEVER THE CURSOR IS MOVED TO A NEW COMPOSE FIELD, THE INPUT BUFFER IS RE-INITIALIZED WITH BLANKS.

T,

T, TINUE>

END

<CONX

\$\$\$\$\$ DISPLAY 8931 HAS BEEN ADDED TO LIBRARY \$\$\$\$\$\$



M,8933  
P,8934,DPT3

\*T

I,8933            DISPLAY FACILITIES - LIGHT PEN OPTION SELECTION

T,

T,THE LIGHT PEN CAN BE USED TO SELECT AN OPTION FROM ONE OR MORE PRE-  
T,DEFINED OPTIONS IN A DISPLAY.

T,

T,OPTIONS APPEAR ON THE SCREEN ENCLOSED BETWEEN LESS-THAN (<), GREATER-  
T,THAN (>) CHARACTERS.

T,

T,WHEN AN OPTION IS SELECTED BY THE OPERATOR, THE TASK ASSOCIATED WITH  
T,THE OPTION (IF ONE WAS PRE-DEFINED) WILL BE SCHEDULED FOR EXECUTION  
T,IN THE 840 AND ONE OF THE FOLLOWING WILL APPEAR ON THE SCREEN DEPENDIX  
T,NG

T,ON HOW THE OPTION WAS DEFINED.

T,

T,                    1. A NEW DISPLAY

T,

T,                    2. THE SAME DISPLAY (REFRESHED TO ORIGINAL FORM)

T,

T,                    3. THE SAME DISPLAY (UNREFRESHED)

T,

T,NOTE THAT OPTIONS DIFFER FROM COMPOSE FIELDS IN THAT A TASK MAY OR MAY  
T,Y

T,NOT BE SCHEDULED. THIS IS BECAUSE THERE IS NO OTHER OPERATOR-ENTERED  
T,DATA ASSOCIATED WITH AN OPTION WHICH REQUIRES PROCESSING BY A TASK.

T,

T,TWO STANDARD OPTIONS EXIST AT THE BOTTOM OF THE SCREEN FOR EVERY DISPY  
T,LAY.

T,THE FIRST PROVIDES THE CAPABILITY TO RETURN THE PRECEDING DISPLAY TO  
T,THE SCREEN. NO TASK GETS SCHEDULED BY SELECTION OF THIS OPTION. THE  
T,SECOND STANDARD OPTION IS ASSOCIATED WITH THE ONE-LINE MESSAGE. USUAX  
T,LLY,

T,SELECTION OF THIS OPTION WILL NOT CAUSE EITHER A NEW DISPLAY TO BE  
T,LOADED OR A TASK TO BE SCHEDULED. HOWEVER, THE CAPABILITY EXISTS TO  
T,ALLOW APPLICATION PROGRAMS TO SPECIFY A DISPLAY AND/OR A TASK TO BE  
T,ASSOCIATED WITH THE OPTION.

T,

T,

T,

T,TINUES>

END

<CONX

\$\$\$\$\$ DISPLAY 8933 HAS BEEN ADDED TO LIBRARY \$\$\$\$\$

✿

1.

1, ED,

i,

T, E

1.

T.

1.

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1.

1.

1.

T, TINUE>

END

§ § § § § §

N,8940  
P,SAME,DPT4  
P,SAME,DPT4  
P,SAME,DPT4  
P,8941  
C,2,/,SAME,DPT4  
X(2DU1-48)

\*T

I,8940            DISPLAY FACILITIES - PROGRAM TABULAR DATA DISPLAY

I,

I,APPLICATION PROGRAMS EXECUTING IN THE 840 CAN DISPLAY DATA IN PRE-DEFX  
I,INED

I,FIELDS WHICH APPEAR ON THE SCREEN AS POUND SIGNS WHEN A GIVEN DISPLAY  
I,IS INITIALLY LOADED. THE POUND SIGNS ARE REPLACED WITH THE TABULAR  
T,DATA AS IT IS RECEIVED FROM APPLICATION PROGRAMS.

T,CAPABILITIES ARE PROVIDED TO ENABLE APPLICATION PROGRAMS TO ADD TO  
T,PREVIOUSLY DISPLAYED DATA, DELETE PREVIOUSLY DISPLAYED DATA, OR UPDATX  
I,E

T,PREVIOUSLY DISPLAYED DATA. USE THE LIGHT PEN OR KEYBOARD TO ACTIVATE  
T,DEMONSTRATIONS OF THESE CAPABILITIES.

I,

I,

T,                    1. ADD 3 CHARACTERS EACH TIME SELECTED                    X

I,    <\*>

I,

T,                    2. DELETE ALL PREVIOUSLY DISPLAYED TABULAR DATA                    X

I,    <\*>

T,

T,                    3. UPDATE CHARACTERS 5-7 EACH TIME SELECTED                    X

I,    <\*>

T,

T,                    4. UPDATE STARTING AT CHARACTER // WITH //

T,

AA            BBBB

I,

SUBFIELD A - DECIMAL VALUE FROM 01-48

I,

SUBFIELD B - ANY DISPLAYABLE CHARACTERS

T,

T,

T,

T,

T,

T,

I,

I,

I,

T,

T,

T,

T,TINUE>

END

<CONX

```

#####      #####
##  ##      ##  ##
#####      #####
##  ##      ##  ##
#####      #####

```

\$\$\$\$\$ DISPLAY 8940 HAS BEEN ADDED TO LIBRARY \$\$\$\$\$

✶ T

## 7.

T.

U.

7.

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1.

1.

1.

EN

-68-



N,8942.

\*T

T,8942        DISPLAY FACILITIES - PROGRAM ONE-LINE MESSAGE DISPLAY

T,

T,APPLICATION PROGRAMS EXECUTING IN THE 840 CAN DISPLAY MESSAGES IN THE  
T,SPECIAL ONE-LINE MESSAGE AREA AT THE BOTTOM OF THE SCREEN. IN ADDITION  
T,ON,

T,THE CAPABILITY EXISTS TO SPECIFY A DISPLAY TAG AND A TASK NAME TO BE  
T,ATTACHED TO THE LIGHT PEN OPTION ASSOCIATED WITH THE ONE-LINE MESSAGE  
T,.

T,

T,IT SHOULD BE NOTED THAT THE MESSAGE AREA IS UNPROTECTED IN THE SENSE  
T,THAT A MESSAGE MAY BE REPLACED WITH A MESSAGE FROM THE SYSTEM OR FROM  
T,ANOTHER APPLICATION PROGRAM BEFORE IT CAN BE READ BY THE OPERATOR.

T,

T,WHEN YOU SELECTED THIS DISPLAY A TASK WAS SCHEDULED WHICH ISSUED THE  
T,MESSAGE SHOWN BELOW,

END

\$\$\$\$\$\$ DISPLAY 8942 HAS BEEN ADDED TO LIBRARY \$\$\$\$\$\$

❖ I

7.

## 7.

1.

1.

1.

1,

END

N,8944  
P,8934.DPT3  
P,8920  
P,8950

\*I

I,8944      DISPLAY FACILITIES - PROGRAM FUNCTION SWITCH ATTACH-DETACH  
I,

I,APPLICATION PROGRAMS EXECUTING IN THE 840 MUST ATTACH TASKS TO THE  
I,DISPLAY CONSOLE FUNCTION SWITCHES (ONE TASK PER SWITCH FOR ANY NUMBER  
I,OF SWITCHES) BEFORE THE SWITCHES CAN BE UTILIZED. ONCE A TASK IS  
I,ATTACHED TO A SWITCH, IT IS SCHEDULED FOR EXECUTION EACH TIME THE  
I,SWITCH IS RAISED BY THE OPERATOR.

I,

I,APPLICATION PROGRAMS CAN ALSO DETACH TASKS FROM FUNCTION SWITCHES WHEN  
I,N

I,IT IS NECESSARY TO STOP THE FUNCTION SWITCH SCHEDULING PROCESS.

I,

I,THE EFFECTS OF THE ATTACH-DETACH FACILITY ARE ILLUSTRATED IN THE SECTX  
I,ION

I,OF THE DEMONSTRATION PERTAINING TO CONSOLE OPERATOR CAPABILITIES.

I,

I,

I,

I,

I, DEMO>

<FUNCTION SWITCHX

I,

I,

I,

<END OF SECTION>

I, TINUE>

<CONX

END

\$\$\$\$\$ DISPLAY 8944 HAS BEEN ADDED TO LIBRARY \$\$\$\$\$\$

N,8950

P,8951

\*T

I,8950 OPERATING SYSTEM FACILITIES

I,  
T,OPERATING SYSTEM SERVICES ARE AVAILABLE TO USERS THROUGH THE FOLLOWING  
I,G

T,EXECUTIVE CALLS.

I,  
I, TASK SCHEDULING  
I, PERIODIC  
I, SINGLE-ENTRY  
I, MULTIPLE-ENTRY  
I, PRIORITY(NON-PERIODIC)  
I, SINGLE-ENTRY  
I, MULTIPLE-ENTRY  
I, NEXT TASK

I,  
I, TASK SUSPENSION  
T, SPECIFIED PERIOD  
I, INDEFINITELY

I,  
T, TASK TERMINATION

I,  
I, TASK DELETION

I,  
I, CHECK TASK STATUS

I,  
I, CROSS-TASK COMMUNICATION  
I, INITIALIZE PARAMETERS-BUFFERS  
I, TRANSMIT-RECEIVE

T,  
T, CROSS-PROCESSOR COMMUNICATION

I,  
I,THIS LIST OF SERVICES INCLUDES ONLY THOSE UNIQUELY SUPPLIED BY MPCs.  
I,ALSO AVAILABLE ARE THE SERVICES PROVIDED BY CHANE INCLUDING THOSE FOR  
T,PROCESSING I-0.

T,  
I, <CONX

T,TIME>

END

\$\$\$\$\$ DISPLAY 8950 HAS BEEN ADDED TO LIBRARY \$\$\$\$\$\$

N,8951  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,SAME,DTS1  
 P,8900,DIS0  
 C,2,0,SAME,DTS2  
 X(3D)(SAMIL,SEC,MIN)  
 C,1,2,SAME,DTS2  
 X(2D)  
 C,1,2,SAME,DTS2  
 X(2D)  
 C,1,2,SAME,DTS2  
 X(2D)  
 C,1,2,SAME,DTS2  
 X(2D)  
 C,1,2,SAME,DTS2  
 X(2D)  
 C,1,2,SAME,DTS2  
 X(2D)  
 C,1,2,SAME,DTS2  
 X(2D)

\*T

T,

T,8951      OPERATING SYSTEM - TASK SCHEDULING DEMONSTRATION

T,

T,SIX TASKS HAVE BEEN PRE-DEFINED FOR USE IN DEMONSTRATING THE SCHEDULING

T,CAPABILITIES OF THE OPERATING SYSTEM, THIS DISPLAY CONTAINS COMPOSE  
 T,FIELDS AND LIGHT PEN OPTIONS TO BE USED BY YOU IN SPECIFYING CERTAIN  
 T,PARAMETERS AND ACTIVATING-STOPPING CERTAIN FUNCTIONS, THIS ENABLES  
 T,YOU TO CONTROL THE DEMONSTRATION AND TO EXPERIMENT WITH VARIOUS TASK  
 T,CONFIGURATIONS.

T,

T,

T,TASK,	A	B	C	D	E	F
T,						
T,TYPE	PER	PER	PER	NON-PER	NON-PER	NON-PER
T,RATE	10 SEC	100 MIL	/// ///			
T,						
T,PRIORITY	05	09	15	01	06	12

```

T,
T,STATUS <*>  ##          ##          ##          ##          ##          ##
T,
T,SCHEDULE   <A>        <B>        <C>        <D>        <E>        <F>
I,
T,SUSPEND
T,  MINUTES   //          //          //          //          //          //
I,  INDEF     <A>        <B>        <C>        <D>        <E>        <F>
T,
I,DELETE     <A>        <B>        <C>        <D>        <E>        <F>
I,
T,TERMINATE                                     <D>        <E>        <F>
I,
T,TASK DATA #####      #####      #####      #####      #####      #####
I,
I,
I,
I,
END

```

<END OF DEMONSTRATION>

\$\$\$\$\$\$ DISPLAY 8951 HAS BEEN ADDED TO LIBRARY \$\$\$\$\$\$

N,9050

\*T

T,9050

#### SPECIAL DISPLAYS

I, SPECIAL DISPLAYS, CHARACTERIZED BY TAGS RANGING FROM 9000 - 9999,  
T,ARE UNIQUE IN THAT THEY MAY CONTAIN ONLY TEXT INFORMATION. NO COMPOX  
T,E

T,FIELDS, TABULAR DATA, OR LIGHT PEN OPTIONS ARE PERMITTED IN THEM.

I, THEY ARE DISPLAYED FROM AN AUXILIARY BUFFER WHILE THE PRECEDING  
T,DISPLAY IS RETAINED IN THE COMPUTER FOR RE-DISPLAY WHEN THE OPERATOR  
I,USES THE LIGHT PEN TO RETURN TO PRIOR LEVEL. ALL DISPLAY INPUTS FROM  
T,EITHER THE KEYBOARD OR 840 APPLICATION PROGRAMS WILL BE USED TO UPDATX  
T,E

T,THE PRECEDING NORMAL DISPLAY RATHER THAN THE SPECIAL DISPLAY.

I, SPECIAL DISPLAYS ARE DESIGNED FOR USE WHEN IT IS NECESSARY TO EX-  
T,PLAIN SOMETHING IN MORE DETAIL THAN IS POSSIBLE IN A ONE-LINE MESSAGEX  
T,,

I,PERHAPS AN ERROR CONDITION. THEY ARE LIMITED TO 12 LINES OF TEXT,  
END

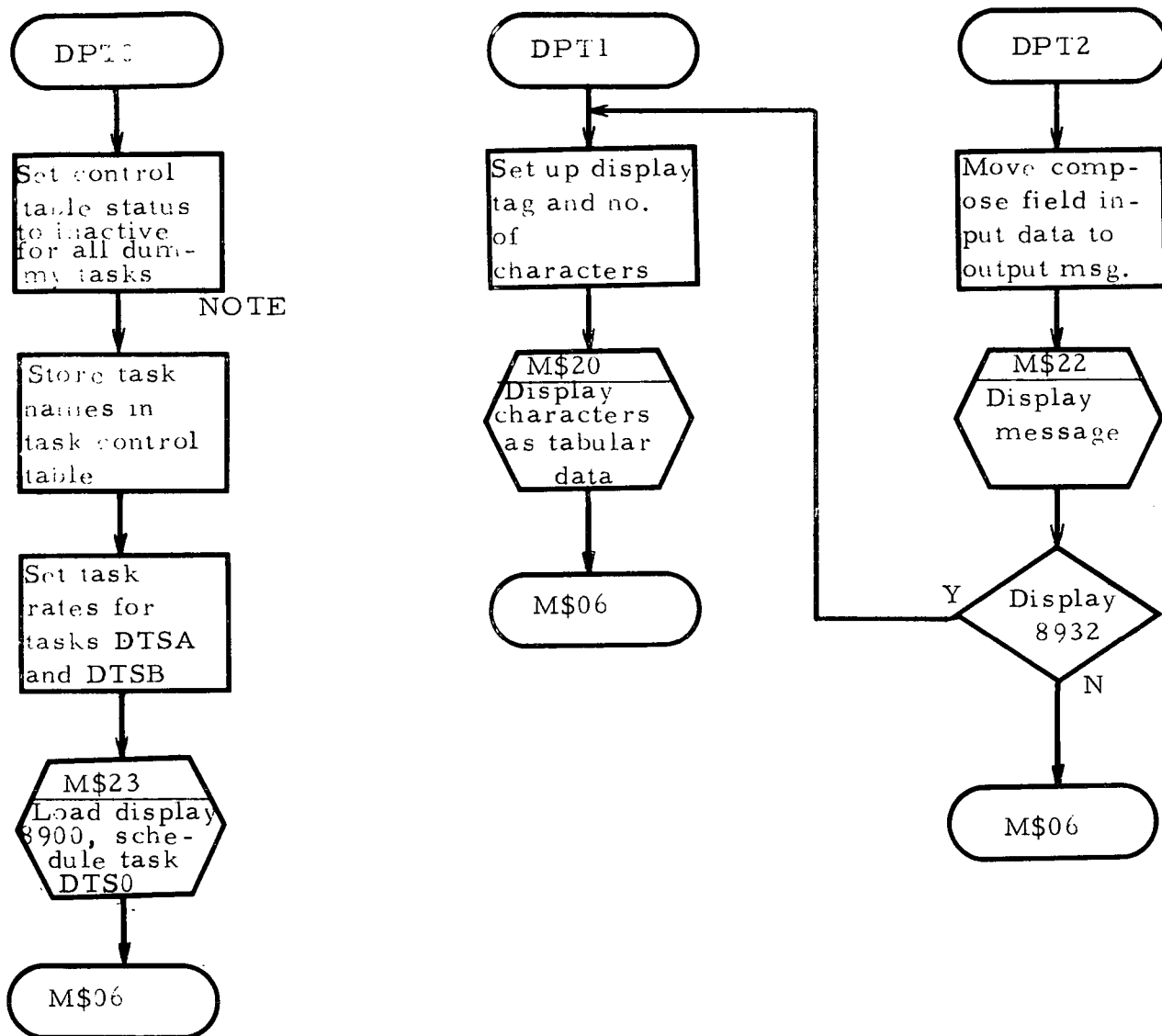
\$\$\$\$\$\$ DISPLAY 9050 HAS BEEN ADDED TO LIBRARY \$\$\$\$\$\$

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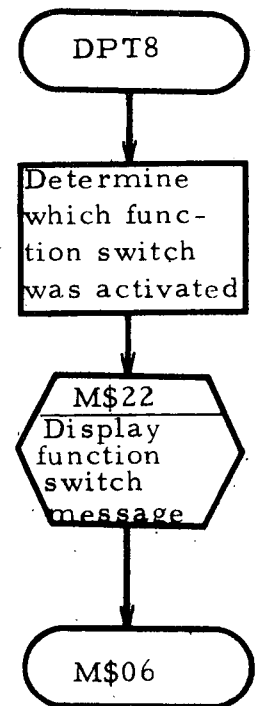
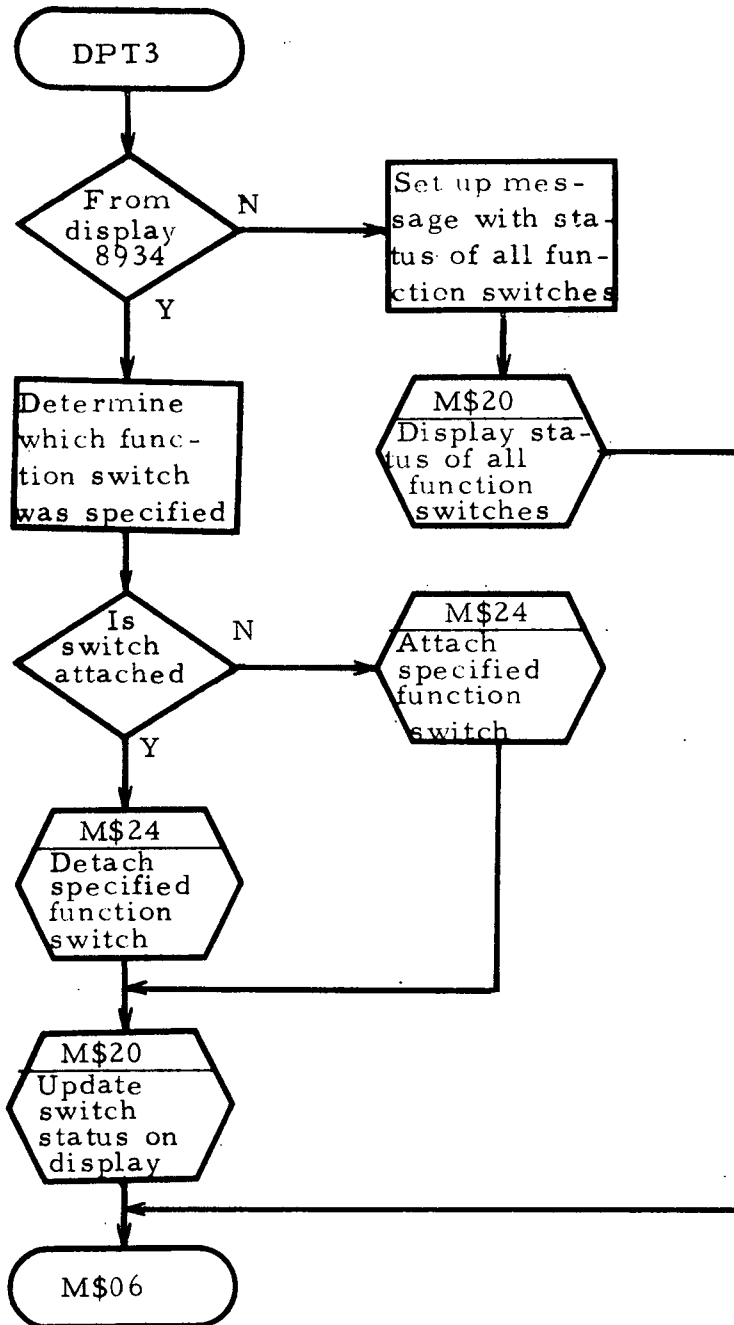
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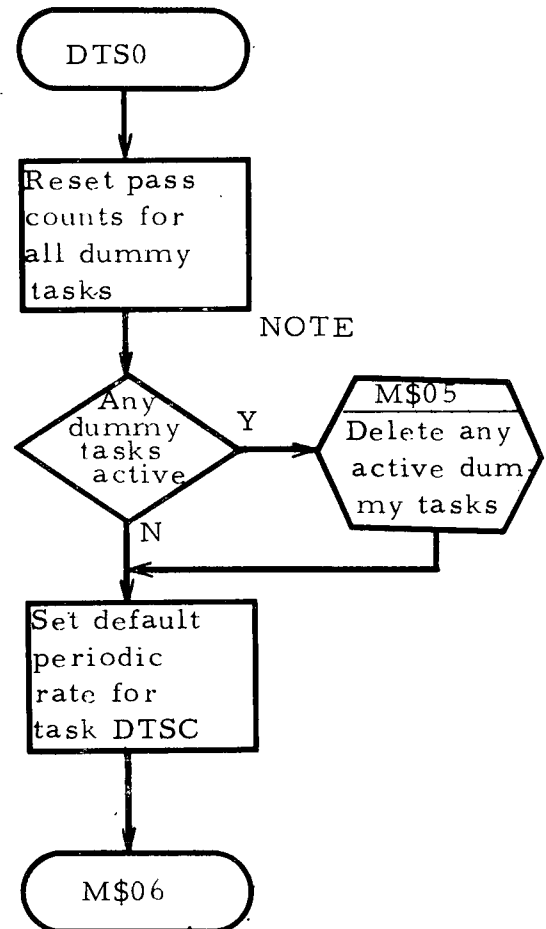
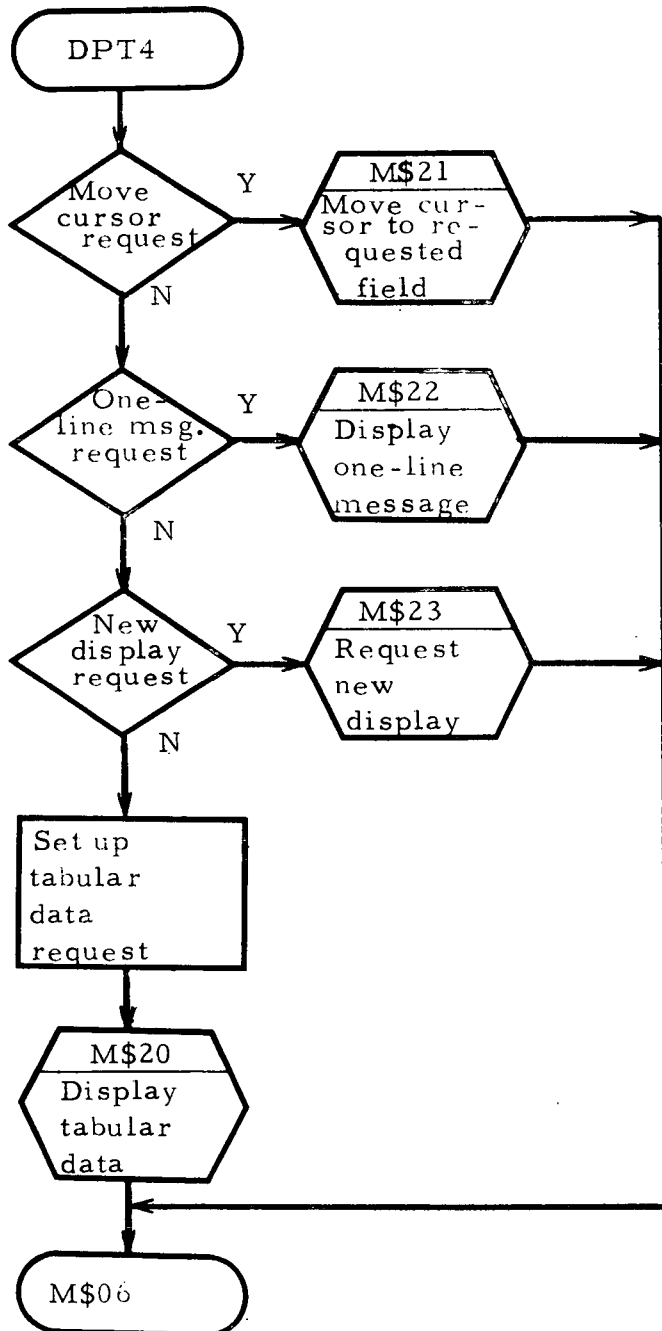
APPENDIX B - CDA Task Flowcharts



NOTE: Dummy tasks are:

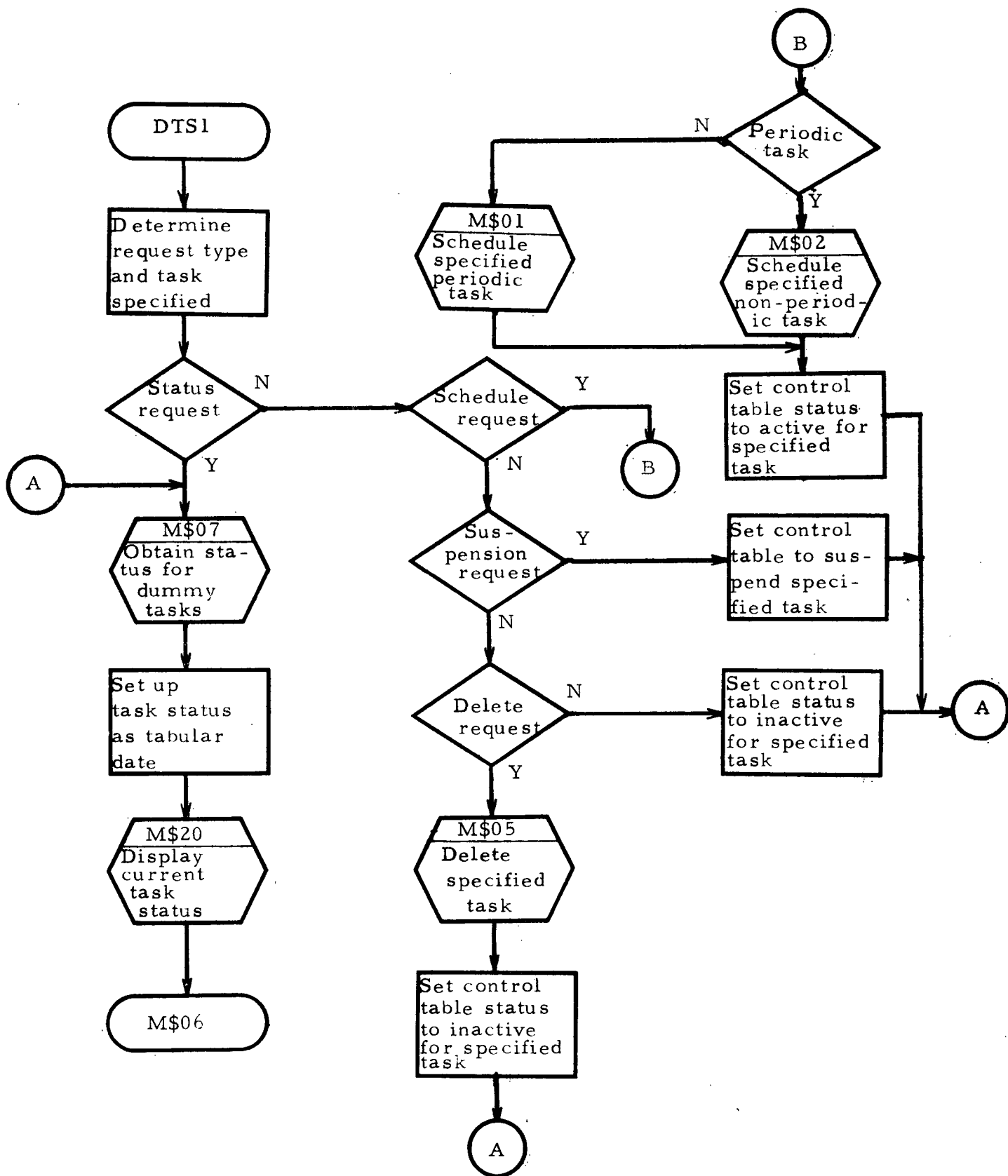
DTSA  
DTSE  
DTSC  
DTSD  
DTSE  
DTSE

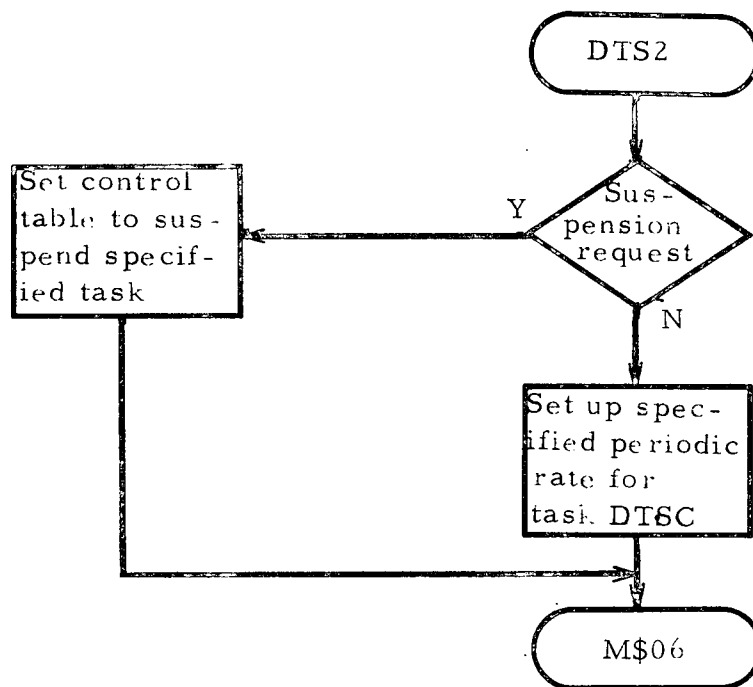


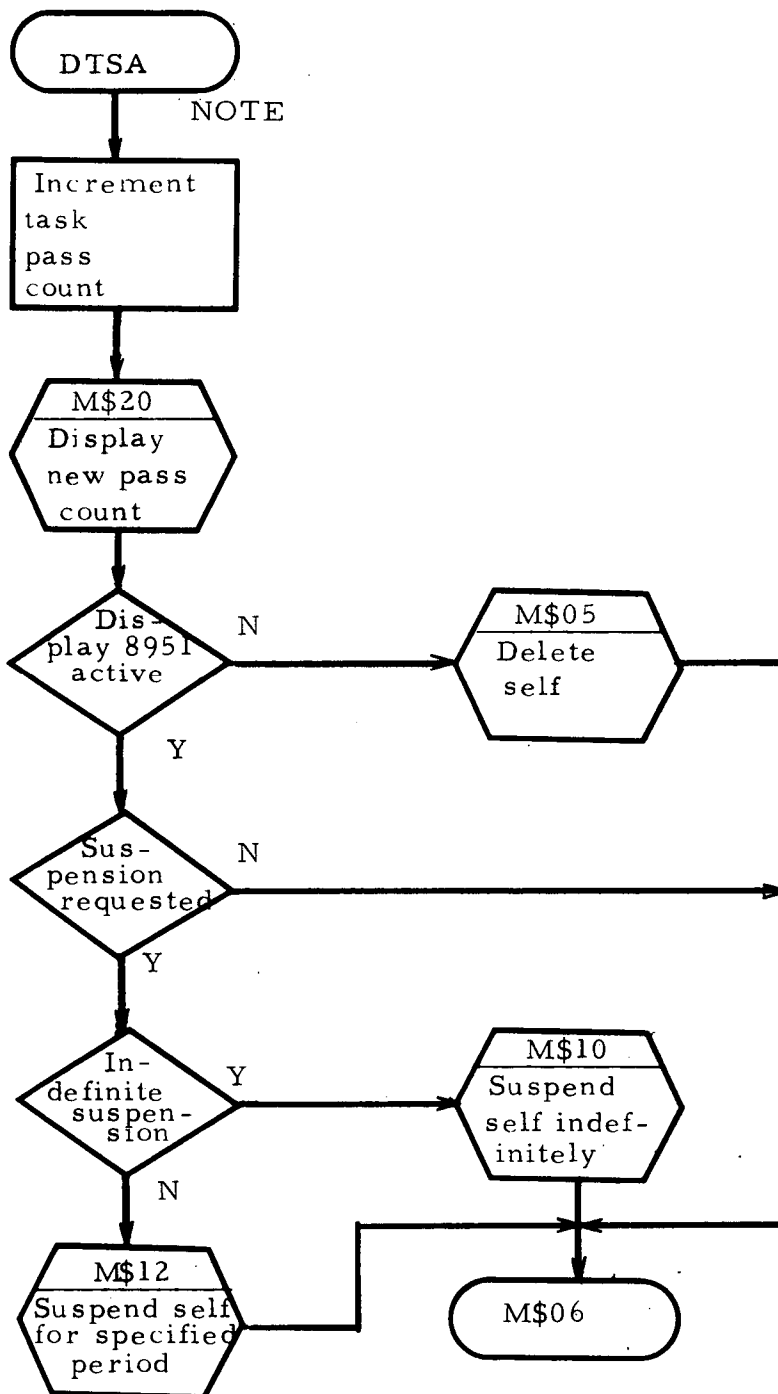


NOTE: Dummy tasks are:

DTSA  
DTSB  
DTSC  
DTSD  
DTSE  
DTSF



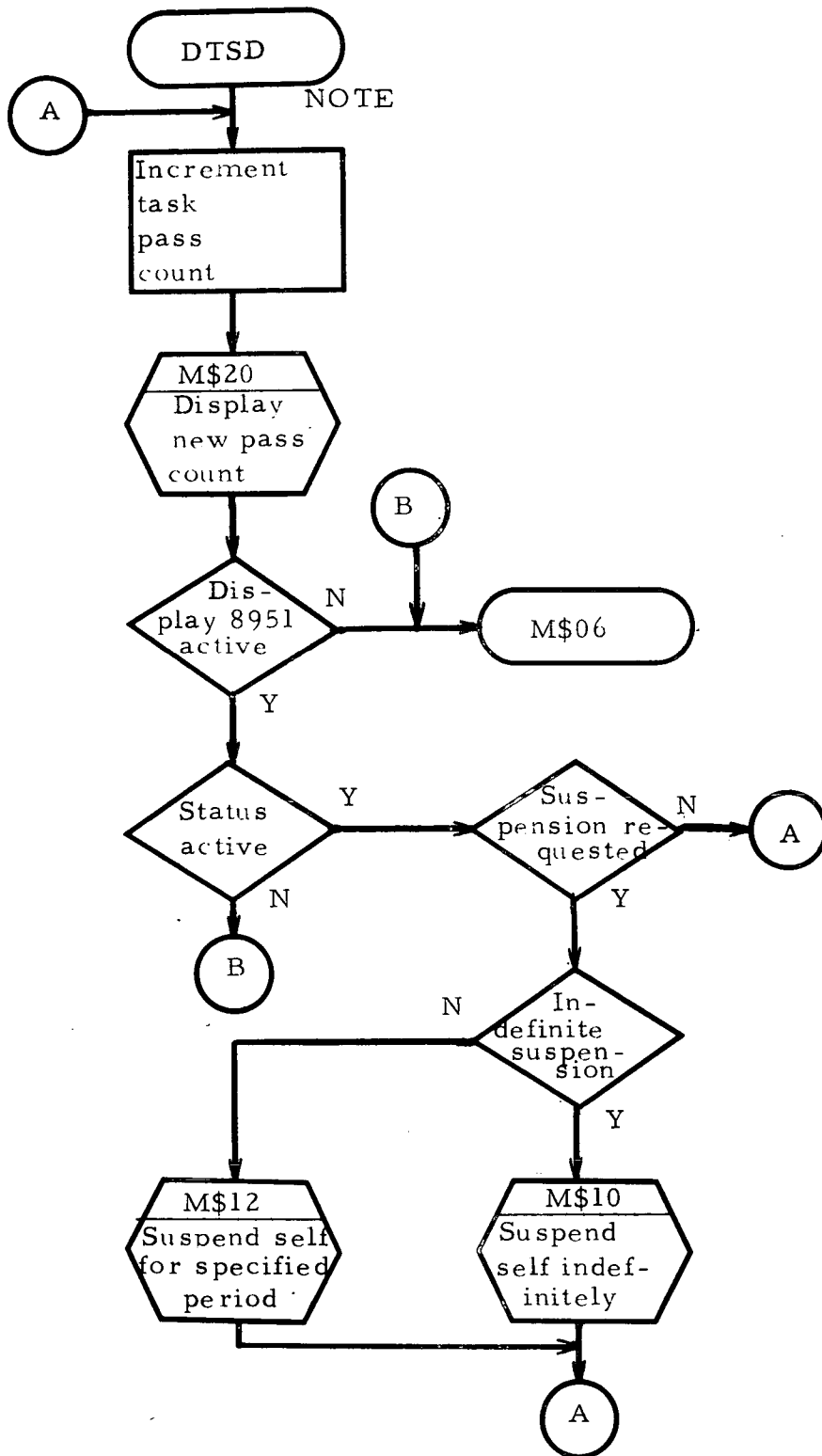




NOTE

NOTE

Tasks DTSC and DTSC are similar to DTSA.



NOTE

Tasks DTSE and DTSF are similar to DTSD



## APPFNDIX C - CDA Job Task Table Input Control Cards

CØM 00036  
 CØM DXT100003  
 CØM DX1200050  
 CØM DXT300003  
 CØM DXT400006  
 CØM DXT800003  
 CØM DXS000003  
 CØM DXS100003  
 CØM DXS200005  
 TQI DPT0DPT0014  
 TQI DPT1DPT1014  
 TQI1DXT100033  
 TQI DPT2DPT2014  
 TQI1DXT200503  
 TQI DPT3DPT3014  
 TQI1DXT300033  
 TQI DPT4DPT4014  
 TQI1DXT400063  
 TQI DPT8DPT8014  
 TQI1DXT800033  
 TQI DTS0DTS0014  
 TQI1DXS000033  
 TQI DTS1DTS1014  
 TQI1DXS100033  
 TQI DTS2DTS2014  
 TQI1DXS200053  
 TQI DTSADTSA003  
 TQIP1200010 REPETITIVE, 10 SECONDS  
 TQI DTS8DTS8009  
 TQIP1100100 REPETITIVE, 100 MILLI-SECONDS  
 TQI DTSCDTSC013  
 TQIP1300001 REPETITIVE, 1 MINUTE  
 TQI DTSDDTSD001  
 TQI DTSEDITSE006  
 TQI DTSFDTSF012  
 END

## APPENDIX D - Simplified CDA Initialization

## APPENDIX D

### Simplified CDA Initialization

Assuming that the CDA displays are contained in the 810B disk library and the CDA programs are contained in the 840MP disk library, the following steps can be used to activate the MPCS CDA. It is also assumed that the operating systems of both computers have been loaded and are awaiting input commands.

810B console keyboard

```
/POSF, BI, MPCSDP.  
/XFER, BI, F=0, L=5000.  
/GOTO, R=300.
```

840MP console keyboard

```
CP MD  
EX  
PC
```

The 810B must be initialized first. The "READY" message should appear on the CRT before the 840MP commands are entered.